Better Homes and Gardens®

WOOD®

THE MAGAZINE FOR HOME WOODWORKERS

$3.95

DECEMBER 1987•ISSUE NO. 20
Display Until December 22

HOLIDAY GIFT SECTION
Begins on page 63

6 FUN-TO-DO SCROLL SAW TECHNIQUES
All shop-tested

HARVEST YOUR OWN BOWL BLANKS
We show you how!

SAW BLADES AND ABRASIVES
What's available, plus buymanship pointers

PEOPLE-PLEASING PROJECTS:
Wine rack
Turned candle holder
Doll stroller
Floral wall plaques
Toy bulldozer
Hand mirror
Money clip & key ring

CRAFT THIS GREAT-LOOKING MANTEL CLOCK
Complete plans, page 54

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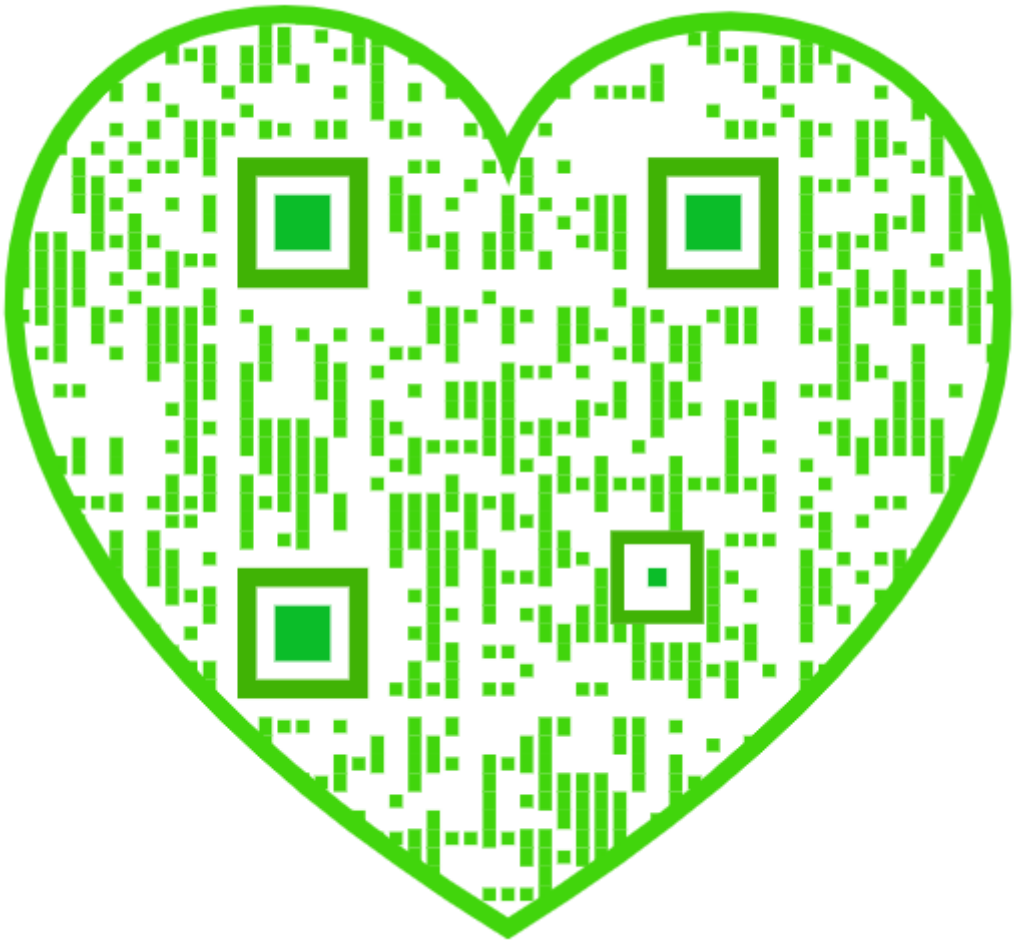
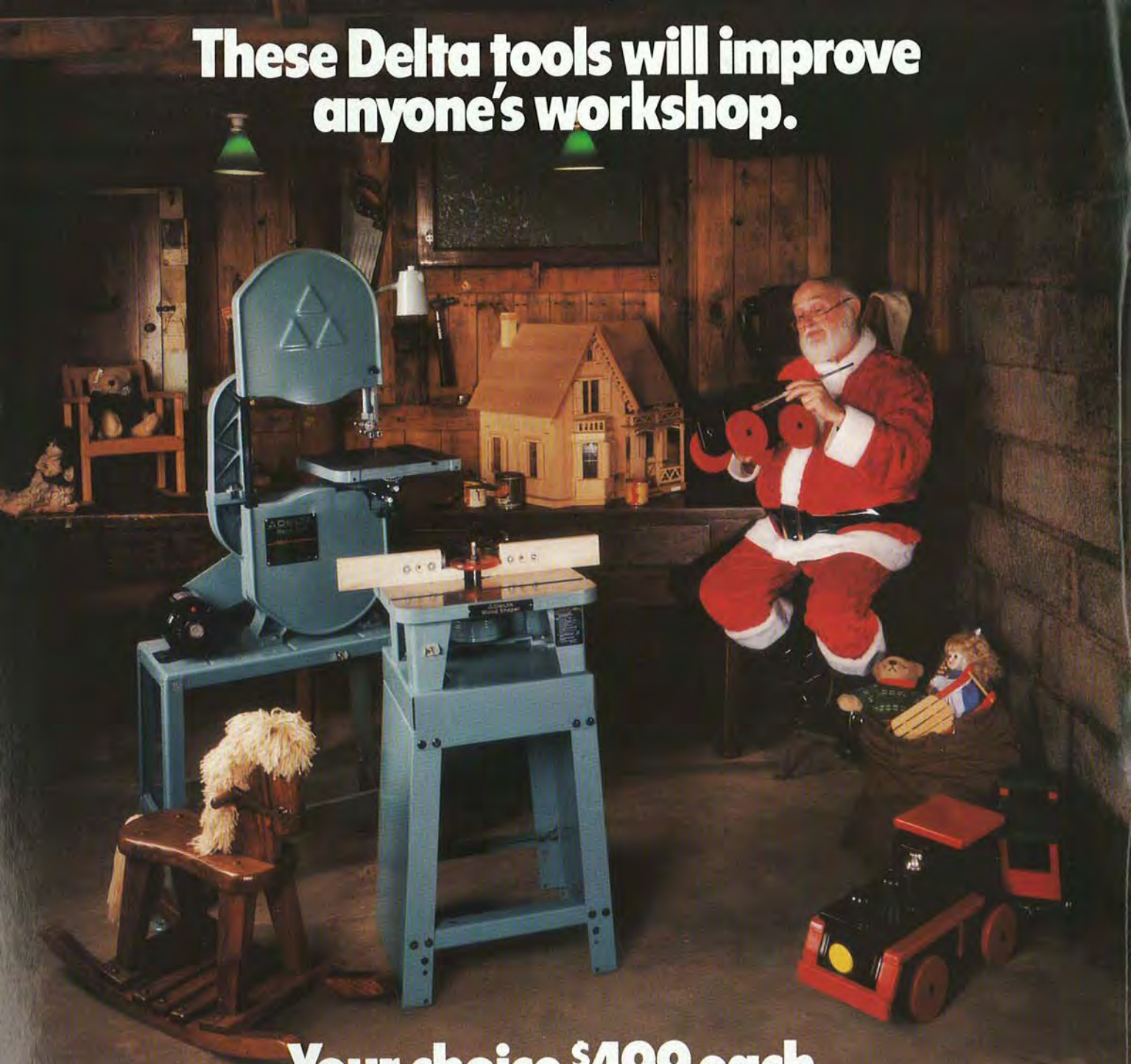


These Delta tools will improve anyone's workshop.



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With a deal *this* good, it's a tough choice to make. Because from now until December 31, 1987, Delta is offering a special low price on our 14" Wood Cutting Band Saw and our Light Duty Wood Shaper. They're built to the same high quality standards that have made Delta tools favorites of woodworkers for the past 50 years. And you can use them to trim a lot more than your tree this year.

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Call toll-free for the name of your Delta dealer. Delta International Machinery Corp., 800/438-2486 (in PA, 800/438-2487).

Offer good only on purchases from participating dealers in the continental U.S., Alaska, and Hawaii, from September 1 until December 31, 1987.

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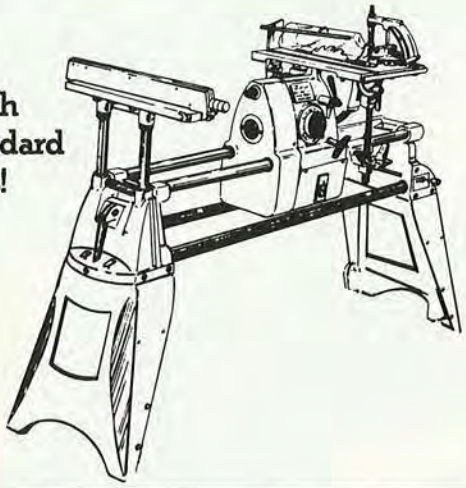

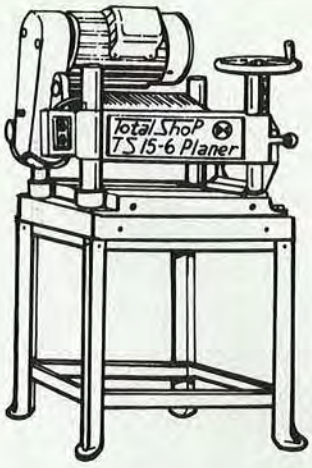

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WOOD®
THE MAGAZINE FOR HOME WOODWORKERS

December 1987 • Vol. 4, No. 6 • Issue No. 20

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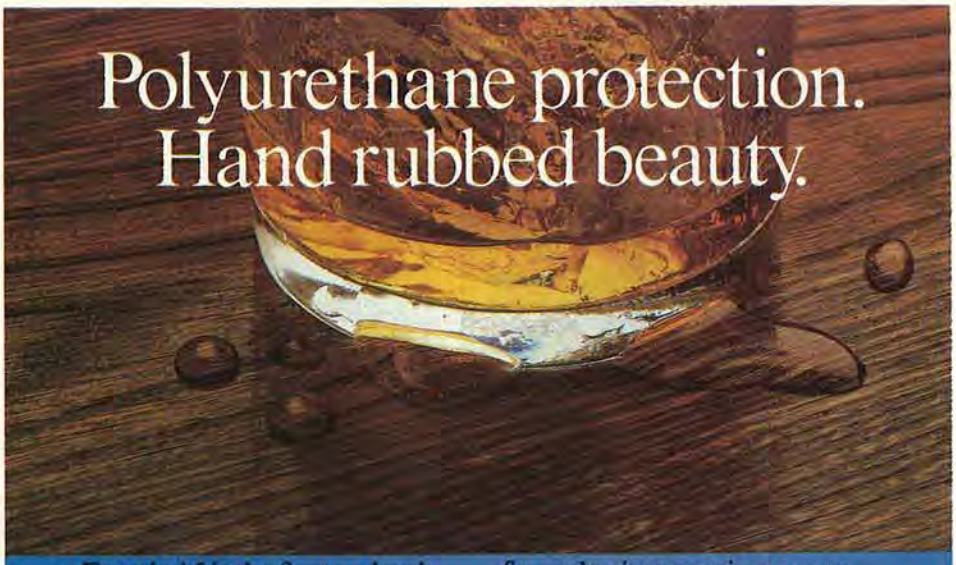

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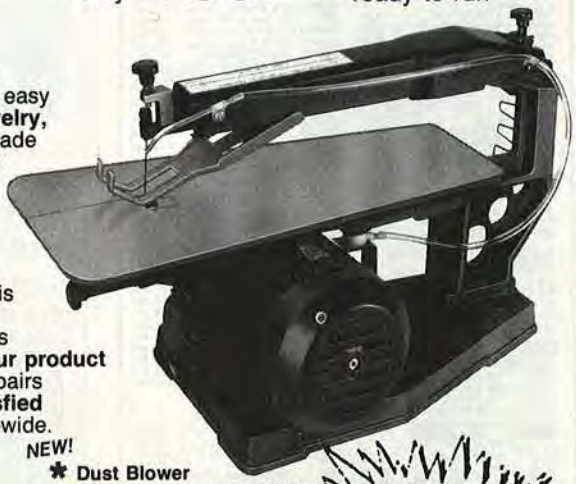

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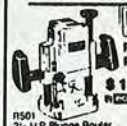

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$72-
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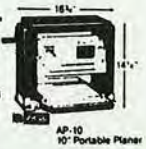
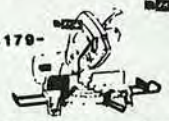


AP-10 10" Portable Planer

$179-



TS-251U Miter Saw with X2300 Accessory Kit

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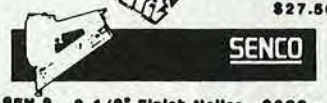

SFN 2	2 1/2" Finish Nailer	$388-
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Better Homes and Gardens®

WOOD®

This issue's cover wood grain: White oak

DECEMBER 1987 **ISSUE NO. 20**

WOOD PROFILE

BALD CYPRESS — THE ENDURING BEAUTY OF THE BAYOU 33

This resident of the swamp resists decay, acts like hardwood, and works well for both indoor and outdoor projects.

SHOP-TESTED TECHNIQUES

6 FUN-TO-DO SCROLL SAW TECHNIQUES 34

The scroll-sawn gifts you'll turn out with these techniques will have your friends and relatives saying "HO HO", not "ho hum."

CRAFTSMAN CLOSE-UP

TEENSY-WEENSY FURNITURE: A WOODWORKER'S ADVENTURE IN LILLIPUT 40

You'll be amazed at the detail Seattle craftsman Noral Olson builds into miniature furniture.

HARVESTING YOUR OWN BOWL BLANKS 44

Invest a few hours searching fields or forests, and come home with enough turning blanks to feed your lathe all winter.

TOOL BUYMANSHIP

KNOW YOUR WOODWORKING ABRASIVES 50

What's the difference between flint, garnet, and aluminum oxide? Our guide will steer you to the best abrasives for all of your sanding jobs.

ONE GREAT-LOOKING MANTEL CLOCK 54

Whether you hang it on the wall or display it on a shelf, this two-way cherry timepiece fits right in.

WOODWORKING BOOKS YOU'LL WANT TO GIVE 58

Make points by giving your woodworking friends a book selected from our list of special favorites.

CARBIDE-TIPPED CIRCULAR SAW BLADES 60
Our tool experts discuss the fine points of buying these increasingly popular circular saw blades.

SANTA'S GALLERY OF GIFTS

SHOWCASE WINE RACK 64
Display your favorite vintages on this compact walnut rack.

CHIMNEY-TOPPED CANDLE HOLDER 67
A perfect mood-setter for winter evenings.

WALNUT MONEY CLIP & KEY CHAIN 68
Both quick-and-easy projects make practical and appreciated stocking stuffers.

DOLL STROLLER 71
Give this stroller to that "special" little one and watch her eyes light up.

FLORAL WALL PLAQUES 74
You can make one set or a dozen of these unique plaques with a simple scroll saw technique.

QUILT-LOOK HAND MIRROR 76
We show you an easy way to make the quilt pattern inlay of cherry and padauk.

FAT CAT BULLDOZER 78
Every little sandbox construction foreman needs a dozer that can build roads, dig lakes, or move mountains.

BUCKLE 'EM UP 80
Materials for these beauties are as near as your scrap wood bin.

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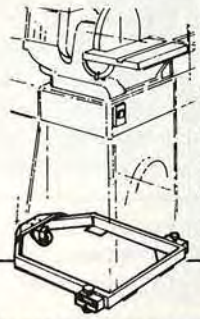

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- makes machine so easy to use and store
- over 80 standard models

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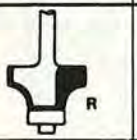
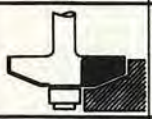
		COVE				
	#01	1/4"R	1/4"	1"	1/2"	$13.00
	#02	3/8" R	3/8"	1¼"	9/16"	14.00
	#03	1/2" R	1/2"	1½"	5/8"	15.00
		ROUND OVER				
	#04	1/4" R	1/4"	1"	1/2"	15.00
	#05	3/8" R	3/8"	1¼"	5/8"	16.00
	#06	1/2" R	1/2"	1½"	3/4"	19.00
		ROMAN OGEE				
	#07	5/32" R	5/32"	1¼"	15/32"	18.00
	#08	1/4" R	1/4"	1½"	3/4"	20.00
	#11	3/8" RABBETING	Deep 3/8"	1¼"	1/2"	14.00
	#09	1/8" (KERF) SLOT CUTTER		1¼"	1/8"	14.00
	#10	1/4" (KERF) SLOT CUTTER		1¼"	1/4"	14.00
	#12	45° CHAMFER	45° Angle	1½"	5/8"	15.00
	#15	RAISED PANEL	20° Angle	1-5/8"	1/2"	25.00
	#35	1/4" V Groove 90°		1/4"	1/4"	8.00
	#36	3/8" V Groove 90°		3/8"	3/8"	9.00
	#37	1/2" V Groove 90°		1/2"	1/2"	11.00
	#16	3/8" Dovetail 9°		3/8"	3/8"	7.50
	#17	1/2" Dovetail 14°		1/2"	1/2"	8.50
	#18	3/4" Dovetail 14°		3/4"	7/8"	10.50
		CORE BOX (ROUND NOSE)				
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	#20	1/2" Core Box	1/4"	1/2"	11/32"	14.00
	#21	3/4" Core Box	3/8"	3/4"	5/8"	18.00
		GROOVE FORMING OGEE				
	#22	1/2" Grooving Ogee		1/2"	3/8"	16.50
	#23	3/4" Grooving Ogee		3/4"	7/16"	21.00
	#24	1/4" Straight Bit		1/4"	3/4"	7.00
	#25	5/16" Straight Bit		5/16"	1"	7.00
	#26	3/8" Straight Bit		3/8"	1"	7.00
	#27	1/2" Straight Bit		1/2"	1"	7.00
	#28	3/4" Straight Bit		3/4"	1"	10.50
	#13	1/2" FLUSH TRIM		1/2"	1"	8.50
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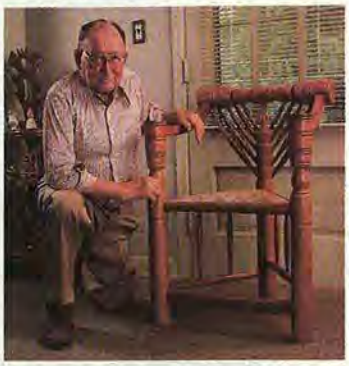
THE EDITOR'S ANGLE

SOME FOLKS NEVER OUTGROW THEIR NEED FOR WOODWORKING



Bill Boian and his favorite 3-legged walnut chair.

When a friend told me about WOOD subscriber Bill Boian, I knew I had to meet him. After all, it's not every day that I get to talk to a 95-year-old woodworker with over 80 years of shop experience under his belt. What an encounter it was! Though our visit was brief, I found out some very interesting things about the person who could very well be WOOD's oldest subscriber.

In case you're wondering whether Bill still generates much sawdust, you'd better believe it. When he retired from a local metal fabricating company in 1957, Bill decided to "get serious" about his favorite hobby. The result: a houseful of beautiful wooden items, from dining tables to turned bowls and vases to reproductions of classic furniture pieces. "I do mostly small projects now because I'm almost out of space," Bill said.

What keeps Bill working away in his workshop after all these years? "I just love wood, I guess. I've got so much wood around this place, I'm not sure if I'll ever get it used up," Bill commented, as he pointed out a 46-year-old piece of 2"-thick x 20"-wide walnut.

As he walked down the steps to his basement workshop, I heard him comment, "I should get this place cleaned up if I could just find the time. We moved here in '41, and I just keep accumulating tools."

What's Bill's secret to staying healthy and active well into his 9th decade? "I think walking as much as I did during my earlier years helped a lot. I always walked to and from work, no matter how bad the weather. I figured it up one time, and I've walked over 40,000 miles."

I also suspect that Bill's quest for knowledge has something to do with his sprightly manner. He told me he likes to learn something new every day — "not necessarily about woodworking, just anything."

Thanks for taking time out to chat, Bill. I enjoyed every minute of it.

Print this article

Larry Clayton

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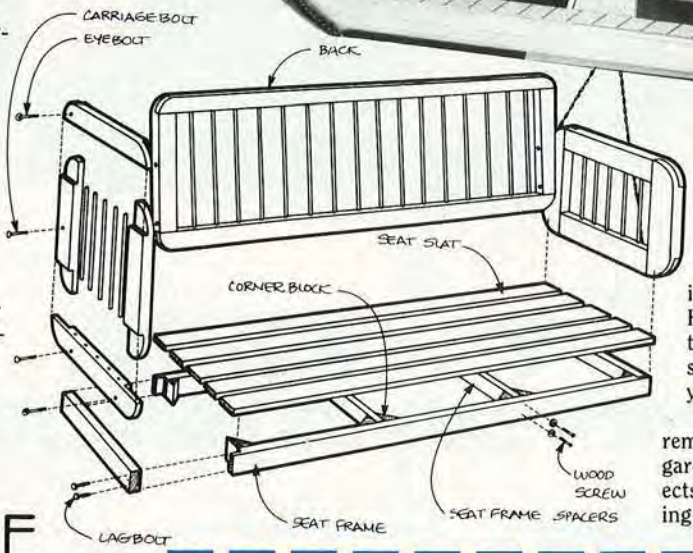

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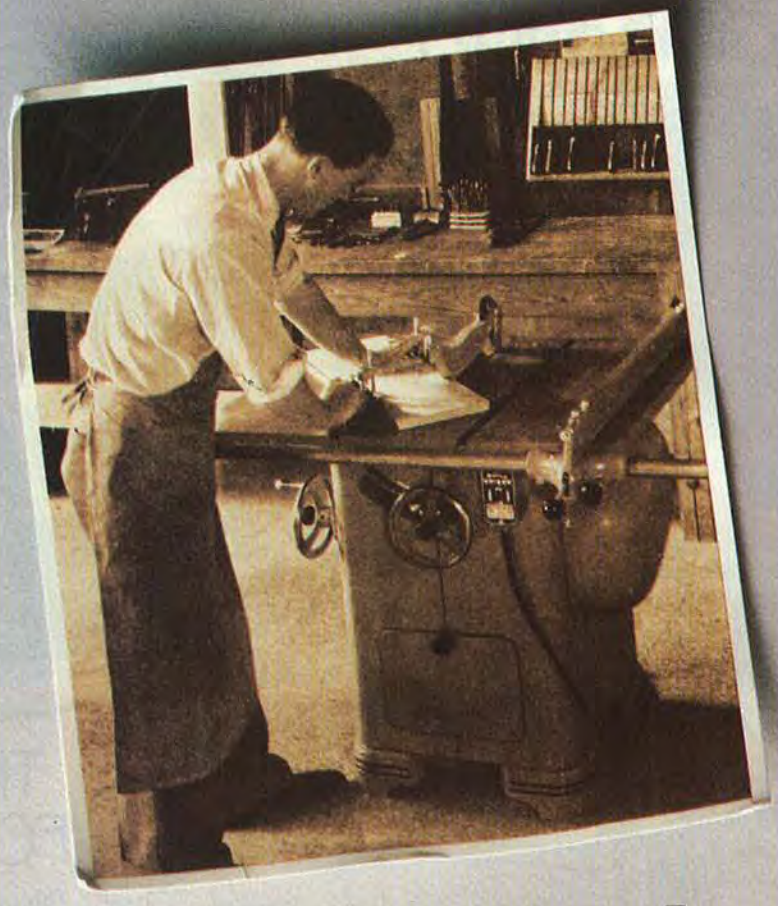

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Right now, Delta is celebrating the Unisaw's 50th Anniversary. And it's the perfect opportunity for a craftsman like you to add the power and performance of our professional quality 10" Tilting Arbor Saw to your home shop.

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It's our anniversary. And we want to give you a present.

What we've already told you makes a good case for buying a Delta Unisaw. But here's another. In honor of the Unisaw's 50th Anniversary, Delta will send you a *free* gift—a special, personalized wooden Commemorative Case containing two 10" carbide-tipped saw blades, a 6" carbide-tipped dado set, and a table insert. It's a $350 value. So you'll get $1982 worth of precision Delta equipment for only $1399 when you buy a Unisaw from now until December 31, 1987.

So don't miss out on the chance to add a Delta Unisaw—and our free Anniversary Gift—to your home shop. And if this one's not exactly what you're looking for, ask about the great values on the seven other models in the Unisaw line. Because no matter what the case, a deal this good only comes along every 50 years or so. Call toll-free for the name of your Delta distributor. Delta International Machinery Corp., 800/438-2486 (in PA, 800/438-2487).

*Model 34-761F

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DELTA
Building On Tradition

TALKING BACK

Print this article

We welcome comments, criticisms, suggestions ...even an occasional compliment. The volume of mail we receive makes it impossible to answer every letter, but we promise to do our level best. Send your correspondence to: Letters Editor, Better Homes and Gardens® *WOOD*® Magazine, Locust at 17th, Des Moines, IA 50336.

WANTED: CARMEN SCHIFANO CLONES

I have just received the August issue and want to express my thanks for the fascinating article on Carmen Schifano. The young adults being taught by such a man are lucky indeed, whatever their economic backgrounds. Oh, how I wish I would have had an instructor like him to impart to me the satisfaction, the happiness, and the justifiable pride that comes from doing a thing well, and doing a thing right.

Carmen Schifano

More power to the Carmen Schifanos of the world. May their teachings be an inspiration to all. I only wish we could clone him and send one to every woodworking class in America.

— Steven V. Smith, Fairhaven, Mass.

Steve, we couldn't agree with you more. Effective, dedicated teachers like Carmen, are invaluable in so many ways. Our thanks, too, to the students who originally invited us to share their story with you.

CRADLE SUPPLIES CORRECTIONS

The Buying Guide for the pendulum cradle featured in the October 1987 issue (page 62) lists Sears as the source for the 17x31″ cradle pad. We've just learned that Sears no longer stocks a pad this size and offers a larger cradle pad using the same catalog number (29H30401) that we listed in the Buying Guide. Unfortunately, this pad will not fit properly in the cradle basket. Sears told us they will issue refunds to any customers who ordered and received the wrong size pad.

We have a new supplier for the 17x31″ vinyl-covered foam pad. It sells for $16.95 ppd., and can be ordered direct from Sleepland, 4412 N.E. 14th, Des Moines, IA 50313.

Also, if you received ⅝″-outside diameter ball bearings instead of the ¾″ we listed in the same Buying Guide, return them to Standard Bearings, P.O. Box 823, Des Moines, IA 50304. They will send you the ¾″ bearings specified in the Buying Guide. Or, if you've received the ⅝″ bearings but haven't drilled the holes for the bearings, just drill ⅝″ holes ¼″ deep.

We apologize for any inconvenience these changes may have caused you.

continued on page 12

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MOD#	DESCRIPTION	Sell
100	7/8 H.P. Router	92
126	Porta Plane	169
310	Laminate Trimmer	129
312	Offset Lam. Trimr	134
330	Speed Bloc Sander	52
314	4 1/2" Trim Saw	124
361	3x24 Belt Sander	174
353	4x24 Belt Sander	189
504	3x24 Belt Sander	335
505	H D Finish Sander	109
518	3 HP 5 Spd Router	335
536	1 1/2 HP H D Router	195
666	3/8" H.D VSR Drill	117
690	1 1/2 H P Router	129
7514	1/2" VSR Drill	119
7533	Adj. Clutch Driver	149
7548	VS Jig Saw	139
9100	Classic (100) Router	119
9118	Porta Plane Kit	189
9852	Versa Plane Kit	295
59381	Hinge Templ Kit	149
59839	Hinge Templ Acc. Kit	89
304	7" Prof. Disc Sander	129
305	7" Prof. Polisher	129
315-1	7 1/4" Circ Saw	124
43263	Carbide Cutter for 126 or 9118 Planes	49

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Bostitch Nail Guns

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N80C	Framing-Coil 6d-16d	395
T36-50	1/2" Crown Stapler	262
T35-8	1" Crown Roofing Stplr	222
T35-40	16 Ga Brads 1"-1 3/4"	282
T31-1	5/8"-1" Brads	129

TR12 3HP Router

$169

Hitachi Power Tools

D10V	3/8" VSR Drill	69
D13	1/2" Spade Hndl Drill	99
DRC10	3/8" Cordl Scrudrill	89
TR6	Laminate Trimmer	83
TR12	3HP Router	169
C7SA	7 1/4" Circular Saw	79
W6VA	0-2500 Screwdriver	79
CR10V	Var Spd Recipro Saw	109
C6DA	6 1/4" Cordl Circ Saw	124
DH38YA	1 1/2" Roto Hammer	299
C10FA	10" Miter Saw	269

Milwaukee Tools

6511 2 Spd $119

0228-1	3/8" VSR Drill	79
0222-1	3/8" VSR Drill	98
0234-1	1/2" VSR Drill	105
0566-1	Drain Cleaner	179
1007-1	1/2" Drill SC	148
1250-1	1/2" Drill	148
1610-1	1/2" Spade Hndl Drill	139
1630-1	1/2" Compact Drill	148
1670-1	1/2" Hole Hawg	195
3002-1	Rt angl Electricians Drill	179
3107-1	Rt angl Drill Kit	199
3300-1	Rt angl Magnum Dri	195
5347	1½" Rotary Hmr	399
5399	1/2" Hammer Drill	179
5455	7"/9" Polisher	136
6012	Orbital Sander	118
6095	9" Sander/Grinder	104
6215	Chain Saw	143
6377	7 1/4" worm Drive Saw	189
6511	2 Spd Sawzall, case	119
6539	Cordless Screwdriver	69
6543-1	0-1000 rpm Screwdriver	149
8975	Heat Gun	59

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Carbide
Blades and Cutters

LM72M010	10x24T RIP	33
LU73M010	10x60T ATB	29
LU82M010	10x60T Tr Chip	38
LU84M011	10x50T Combo	38
LU84M012	12x60T Combo	69
DS308	8" Dado Set	109
FB100	16 Pc Forstner Bit Set	138
DB050	50 Piece Drill Bit Set	59
90-100	15Pc Router Bit Set	139

94-100	5Pc Router Bit Set	145
99-210 thru	Raised panel	
99-213	Router bit each	58
SC001	Blade Stabilizer 5/8" bore	17
TT108	8Pc Lathe Turning Set	55
EC210 to 213	Raised Panel	89
EC260	3/4 Stile-Rail Shpr Bit	165

EC090	Complete Cabinet Set	166
EC091	Cove and Bead Set	166
EC900	Shaper Door System Set	265
99 034	Lock Miter Router Bit	59
99 032	Wedge tongue rtr bit	48
99 033	Wedge groove rtr bit	48
99 260	Ogee stile & rail rtr bit	79
99 263	cove-bead stile-rail bit	79
99 PK1	Multiform Router Bit	75
WB101	Woodworking Box	269

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MOD #		
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E3800	0-4000 Drywall Dr.	79
E3810	0-2500 Drywall Dr.	79
JSE60	Jig Saw Var Spd	119
RJ100VK	VS Recipro Saw	109
S500A	Block Sander	37
SP1800A	7" Sander Polisher	109
TR30U	Laminate Trimmer	79
TS251U	10" Miter Saw	169
TS380	14" Miter Saw	339
W200S	16 1/4" Beam Saw	319
RA200	8" Portable Rad Arm Saw	247
BD101R	3/8" Cordl Drill	47
R501	Plunge Router	169
B7100	3x24 Belt Sander	129
AP10	Planer Blades	25

$345

Skil Tools

77	7 1/4" Worm Dr Saw	134
471-2	1/2" Impact Wrench W/Case	159
492	VS Jig Saw	49
542	Spade Handle Drill	109
551	5 1/2" Circular Saw	79
597	3/8" VSR Drill	59
598	1/2" VSR Drill	69
7565	Palm Sander	39
2016-2	3/8" cordl vsr Drill	95

Makita Power Tools

$109

1100	3 1/4" Planer w/case	179
1900BW	3 1/4" Planer Kit	119
2708	8 1/4" Table Saw	219
3601B	1 3/8" HP Router	129
3612BR	3HP Plunge Router	189
4200N	4 3/8" Trim Saw	109
5077B	Hypoid Dr Saw	149
5081DW	3 3/8" Cordless Saw	119
5402A	16 3/16" Beam Saw	329
5600DW	Cordl. Circ Saw 6 1/4"	169
6012HDW	3/8" Cordl Scrudrill	109
6301LR	1/2" D Handle Drill	129
6510Lvr	3/8" VSR Drill	76
6801DBV	0-4000 Drywall Scrugun	89
6905B	1/2" Impact Wrench	159
6906	3/4" Impact Wrench	319
8419B2W	3/4" Hammer Drill	159
9030	1" Belt Sander	139
9207SPB	7" Polisher 2 Spd	145
9501BK	4" Mini Grinder	69
9820-2	Blade Sharpener	169
9924B	3x24" Belt Sander	129
B04550	Block Sander w/Bag	49
DP4700	1/2" VSR Drill	107
HP1020	3/8" Hammer Drill	69
HP1030W	3/8" Hmr Drill/case	99
JR3000V	Var Spd Recipro Saw	119
	Carbide Planer Blade for MAKITA 1100 & 1900	29

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AM39-HC2	1.5 Gal Single Tank	259
AM39-HC4	3.8 Gal Twin Tank	279
AM39-HC4V	3.8 Gal Twin Tank	279

1.5 H.P. 115 Volt 125 PSI		
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AM77-HC4	3.8 Gal Twin Tank	298
AM77-HC4V	3.8 Gal Twin Tank	299

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1179	3/8" Drill 0-1200	79
1980	3/8" Cordl drill w/Clutch	99
3051	7 1/4 Worm Dr Saw	119
3103	2 Spd Cutsaw	89
4010-10	Palm Sander	39
1703	10" Miter Saw	159
6513-09	1/2" Dr. Impact Wrench	119
98003	Cordl Drill Battery Pack	38

Delta Carbide
Blades and Cutters

35-613	10 x 40 ATB	34
35-617	10 x 50 Comb.	36
35-623	10"x80T ATB	59
35-677	14"x108T ATB	99
35-647	12"x72T ATB	69
35-626	10"x60T ATB	49

Prepaid Freight to 48 States Any Item This Page

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Bosch Power Tools

1581VS	Orbital Action Jig Saw	124
11202B	1 1/2" Roto Hammer	349
11203B	1 1/2" Roto Hammer	349
1601	1 HP Router	89
1604	1 3/4 HP Router	119
3230	Jig Saw	49
11305	30lb Demo Hammer	645
1608T	Tilt Base Lam. Tr'mr	89
1609	Offset Laminate Tr'mr	115
1609K	Lam Tr'mr Inst. Kit	165
1651	7 1/4" Circ Saw	89

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#W175100	1¾" $15.60/100
#W200100	2" $19.50/100
#W22520	2¼" $7.30/20
#W25020	2½" $8.80/20
#W27520	2¾" $10.20/20
Axle Pegs	
#AP1	fits 1"-2" $4.10/100
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#705020	Front $6.30/20
#7050100	$25.50/100
(Order AP4 Peg for above)	
#705120	Dual Rear $10.50/20
#7051100	$42.90/100
#AP5	Axle Pegs for Dual Rear Wheel $1.98/20
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#7280	2½" $1.90/10
	$13.90/100
#7227	1¾" $1.10/10
	$7.60/100
Oak Shaker Pegs	
#SKP2	3½" $3.35/10
	$28.00/100
#7261	1¾" $2.00/10
	$15.00/100
Birch Mug Pegs	
#7237	3¼" $2.27/10
	$19.90/100
Birch Country Pegs	
#1770	3½" $1.80/10
	$13.00/100
Birch Spindles	
#S6	5¾" $.49/ea.
#S85	9" $.85/ea.
#S110	11" $1.35/ea.
Birch Dowel Pins	
#1142	¼"×2" $1.90/100
	$8.50/500
#1382	3/8"×2" $2.00/100
	$9.25/500

Part No.	Price
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#S10AK	1-1/8" $1.50/10
	$12.00/100
#S40AK	1½" $2.40/10
	$22.00/100
Birch Screw Hole Buttons	
#1432	3/8" $1.76/100
	$7.50/500
#1434	1/2" $1.76/100
	$8.00/500
Oak Screw Hole Buttons	
#1452	3/8" $3.70/100
	$15.50/500
#1454	1/2" $3.80/100
	$16.00/500
Birch Candle Cups (T, H)	
#7290	1" $2.00/10
	$13.00/100
#CC1	1½" $2.90/10
	$19.00/100
2" Brass Eagles	
#878	$2.49/10
Quartz Clock Movement W/Hands	
#Q82	1-4 $6.48/ea.
#	5-9 $5.10/ea.
#	10-24 $4.55/ea.
#	25+ $3.95/ea.
Push-Thru Lamp Socket	
#940	$1.59/ea.
Lazy Susan Bearings	
#LC3	3" $.95/ea.
#LC4	4" $1.25/ea.
#LC6	6" $2.25/ea.
#12C	12" $5.99/ea.
Clipboard Clips	
#L5	3" $.55/ea.
#ST6	6" $.75/ea.
Magnetic Strip	
#120A	120"×½" $4.40/roll
Paper Towel Roller (spring loaded)	
#7238	$1.19/ea.
Toy Train Plans	
30" #T55	$6.99/set

Part No.	Price
Picture Hangers	
#S23	1-7/8" $4.70/100
Mini Hanger	
#7247	5/8" $2.60/100
Saw Tooth Hangers	
#S59	1-5/8" $4.17/100
#S60	2¾" $4.50/100
#406	Self-Fastening Hangers $4.77/100
Prong Hanger	
#7248	$2.90/100
Solid Brass Cup Hooks	
#812	1/2" $5.55/100
#858	5/8" $6.30/100
#834	3/4" $7.45/100
6" Brass & Porcelain Hooks	
#6417	3 Prong $5.85/ea.
#6416	2 Prong $2.97/ea.
Black Hammer Hinge w/Screws (1-1/2", 3-7/16")	
#1730	$1.62/2
	$7.17/10
Brass Plated Hinges	
#910	1" $1.49/10
#928	1½" $2.39/10
Screws for Above	
#F124	$2.40/100
Production Screws	
#6277	1¼"×#6 $1.70/100
#6278	1-5/8"×#6 $1.90/100
#6279	2"×#6 $2.50/100
#6282	3"×#8 $4.75/100
Sand Paper Sheets 9" × 11"	
#81220	220gr $16.75/100
#81150	150gr $16.80/100
#81120	120gr $16.90/100
#81100	100gr $17.20/100
#81080	80gr $11.50/50
#81060	60gr $11.60/50
#81050	50gr $11.70/50
#81234	Assort $16.50/70
Sanding Belts 3"×21"	
#1700	120 gr $12.20/10
#1701	80 gr $13.00/10
#1702	50 gr $13.50/10
#1703	36 gr $14.65/10
3"×24"	
#1704	120 gr $13.10/10
#1705	80 gr $13.50/10
#1706	50 gr $14.60/10
#1707	36 gr $15.85/10
Sanding Belt Cleaner 8"	
#1710	$5.37/ea.

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TALKING BACK

Continued from page 11

A DUST COLLECTOR SUCCESS STORY

I read your recent articles on dust collectors with great interest. I've purchased a new Total Shop #TS-110 and would like to tell you about my success in installing it in my shop.

Actually, I installed the collector just outside the shop and ran a 4" thin-wall PVC feed pipe through the wall, then connected it to the vacuum with a short length of flexible hose. Inside the shop I used T-fittings for runs to the saw, Shopsmith, drill press, and the floor. By boring a hole in the center of a PVC cap, I was able to adapt my regular shop vacuum hose to the end of the PVC pipe.

When using a tool, the collecting lines to the other tools need to be shut off. At first I just put a piece of Masonite over the unused ends. This worked, but I've purchased some PVC end caps for this. My total cost for pipe, fittings, and flexible hose was less than $47. And, I'm happy to say, my setup does an excellent job of keeping the dust controlled.

— C. H. Crandall, Sterling Heights, Mich.

LOOKING FOR BACK ISSUES OF *WOOD*

I need your help in finding issues 1, 2, 3, and 5 of *WOOD magazine. I have all the others and would like to have these too. I contacted your Shopping Service but with no luck. Ever think about a second printing?*

— Joseph Weckermeyer, Imperial, Mo.

We're sorry Joe, but the recent back-issue sale completely cleaned out our limited inventory of early issues. We wish we could help you, but unfortunately there are no more copies of issues 1, 2, 3, 4, 5, and 9 available. Maybe you can find a reader willing to part with the issues you lack. Check with local libraries, too. They'll sometimes sell duplicate copies.

SHAME ON YOU LEFTIES

I am a 54 year-old left-hander who seldom thinks about it until I hear another one complaining (Talking Back, August 1987). Thanks to the right-handed world, I have been trained all my life to be almost ambidextrous. I consider any circular saw with the blade on the right side as being built for a left-handed person because I can see the blade and pencil line clearly and actually split the mark easier than a right-handed person.

When a right-handed person injures his right hand he is usually out of commission. But when a lefty hurts his left hand, he can usually keep on working with his right hand because he's been trained to use it throughout his life.

I'm a "lefty" and would not change, even if I could.

— Richard L. Stanley, Los Lunas, New Mexico

MACHINERY—POWER TOOLS—ACCESSORIES

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BW15P—15" PLANER—W/3HP motor 2 speed, stand, hood, Deluxe Model, Motor in stand . . . . . $795.

BW20P—20" PLANER—W/3HP motor 2 speed, stand, hood, deluxe model, motor in stand. . . . . $1195.

BW14BS—14" BANDSAW—W/¾HP motor, stand, cast iron table (Elephant Factory) . . . . . $225.

BW1S—½" SPINDLE SHAPER—W/¾HP motor, stand. Deluxe reversing model $225.

BW6J—6"x42" JOINTER—W/1HP motor, stand, Pro Center Fence, surface-ground tables . . . . . $289.

BWSG1—1"x42" BELT SANDER with 9" disc, w/motor, 110V with cord and plug . . . . . $99.95.

SS-15, 15" SCROLL SAW w/motor a very popular item complete with blade . . . . . $129.95.

SF-015, 1HP, BAG DUST COLLECTOR, 2 bags, portable w/motor . . . . . $295.

MEAT CUTTING SAW—For all you hunters, SS table, floor model with 110V motor . . . . . $250.

CABINET SHOP MACHINES

SHG 1300, 13"x6" PLANER, segmented feed roll & chippers, w/3HP motor . . . . . $1695.

BW16PV, 16"x7" PLANER, segmented *feed roll & chippers, variable speed feed, bed roll height adj.—w/ American made TEFC 220V 1 PH motor . . . . . $2495.

BW20PV, 20"x7" PLANER W/5HP American motor. 220V, Single phase . . . . . $2995.

BW508PVG, 20"x8" PLANER with all above *features + 2 motors, grinder. All American motors, 1PH . . . . $4195.

BW612PV 24"x8" PLANER with all *Above features + powered table rolls and up/down power table . . . $5995. with grinder . . . . . $6495.

BW-10TAS T/A FLOOR MODEL SAW 10" deluxe with 3/HP American motor and American VEGA fence 50" . . . . . $1295.

MS-12 MORTISER—Hollow chisel type all cast iron floor model . . . . . $1095.

HJ8L 8"x70" JOINTER, all cast iron center fence 0–45°, with 2HP 1PH motor, 4 knife cutterhead . . . . . $1295.

BW2400P—Professional 24"x6" PLANER, segmented in-feed rolls, chippers, dust hood, 5 HP 1PH American Motor, close out. . . . . $2995.

BWPBS-500—20"x12" Vertical Bandsaw w2/HP 220V 1PH motor . . . . . $1295.

BWS-25 25" WIDE BELT SANDER with Platen, w/10HP 3PH motor . . . . . $5795.

BWS-37—37" WIDE BELT SANDER with platen, 2/15HP 3PH motor . . . . . $8495.

BW462M, 4 side MOULDER/STICKER w/3PH motors, less heads . . . . . $8700.

BWM314, 3 side MOULDER/PLANER w/3PH motors, with tooling. . . . . $6800.

POWERMATIC® MACHINERY

CABINET SHOP MACHINES

MODEL 66 T/A POWER STAR SAW w/2HP motor 28" Biesemeyer fence . . . . . $1595.

MODEL 66 T/A SAW, 50" Biesemeyer fence and 3HP motor . . . . . $1795.

MODEL 26 POWERSTAR SHAPER w/2HP motor . . . . . $1295.

MODEL 26 SHAPER w/3HP motor . . . . . $1495.

MODEL 50 6" JOINTER, w/stand, w/motor. . . . . $1095.

MODEL 60 8" JOINTER, w/stand, w/motor. . . . . $1495.

MODEL 141 14" BANDSAW, w/stand, w/motor . . $1195.

MODEL 100 12" POWERSTAR, 2/HP motor . . . . $1595.

VEGA 50" FENCE SYSTEM, for your 10"–12" table saw—super smooth operation—Super accurate, easy sliding, vernier sight glass, Made in U.S.A. . . . . $239.

MiniMax MACHINERY

S45 BANDSAW . . . . . $1097.

FS-35 PLANER/JOINTER . . . . . $2189.

MORTISER FOR FS-35 . . . . . $199.

T3 SHAPER . . . . . $1510.
Sliding Table . . . . . $454.
Miter Gauge . . . . . $52.

L55 STROKE SANDER . . . . . $2987.

T100 LATHE . . . . . $874.

CT-100 COPIER . . . . . $813.

T120 LATHE . . . . . $964.

T120 COPIER . . . . . $869.

SCMI/MM UNO 37" WIDE BELT SANDER 18 HP—2-speed, 3 phase 220V . . . . . $8895.

BRIDGEWOOD® BED & FEED ROLL GAUGE SET—supplied in felt-lined wooden box, three castings & one dial indicator to .001" accuracy. Accurately Adjust Planer Knives, Jointer Knives, Bedrolls, etc. This is a must for all shops. Only . . . . . $149.95 TOTAL

SLOW SPEED TOOL GRINDER Model 40250, 10" Dia. x 1¾" white wheel, 5"D fast wheel, ¼HP motor 110V AC 1PH. Water bath for large wheel, 38 lbs. Closeout $95.00

BRIDGEWOOD® BWBS-18 BANDSAW 18" wood cutting, 11" Ht. under guide, W/2HP motor, w/stand. . . . . $595.

SANDING BELTS Need sandpaper belts? We stock the following sizes and grits. All are aluminum oxide, cloth back. Try some of these top quality belts, we are sure you will like them.

SIZE	GRIT	PRICE EA	PRICE EA 10 OR MORE	SIZE	GRIT	PRICE EA	PRICE EA 10 OR MORE
1 x 42	60			5 x 48	60		
1 x 42	100	$ .95	$ .75	6 x 48	100	$ 3.99	$ 2.89
1 x 42	120			6 x 48	120		
3 x 21	60			6 x 89	60		
3 x 21	80			6 x 89	100	8.99	6.89
3 x 21	100	1.49	1.10	6 x 89	120		
3 x 21	120						
3 x 24	60			25 x 60	60		
3 x 24	80			25 x 60	100	24.95	21.95
3 x 24	100	1.69	1.25	25 x 60	150		
3 x 24	120						
4 x 24	80		1.89	37 x 60	60		
4 x 24	60	2.25		37 x 60	100	34.95	30.95
4 x 24	100	2.25		37 x 60	150		
4 x 24	120		1.89				

MARATHON® ELECTRIC MOTOR SALE

NEW-IN STOCK FOR IMMEDIATE SHIPMENT

MADE IN U.S.A.—SINGLE PHASE-TEFC, BALL BEARING

½ HP 1800 RPM (NEMA 56)	$ 95.00
½ HP 3600 RPM (NEMA 56)	$ 75.00
1 HP 1800 RPM (NEMA 56)	$125.00
1 HP 3600 RPM (NEMA 56)	$109.00
2 HP 3600 RPM (NEMA 56)	$139.00
3 HP 3600 RPM (NEMA 182)	$225.00
5 HP 3600 RPM (NEMA 184)	$325.00

MADE IN U.S.A.—THREE PHASE-TEFC, BALL BEARING

1½ HP 1800 RPM (NEMA 143)	$125.00
3 HP 3600 RPM (NEMA 182)	$150.00
5 HP 3600 RPM (NEMA 184)	$184.00
7½ HP 3600 RPM (NEMA 213)	$240.00

MOTORS SHIPPED FOB YORK, PA.

BRIDGEWOOD® REPLACEMENT KNIVES FOR JOINTERS AND PLANERS. Hi-grade VEW S600 (M2 Steel) knives. Exact sizes listed. Sets noted are packaged in strong plastic cases.

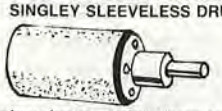
3 PC/SET 6" x 11/16" x .093"	$ 23.95
3 PC/SET 8" x ¾" x ⅛"	29.95
4 PC/SET 8" x 1⅛" x ⅛"	46.95
3 PC/SET 12" x 1⅛" x ⅛"	54.95
4 PC/SET 12" x 1⅛" x ⅛"	72.95
3 PC/SET 13" x 1⅛" x ⅛"	57.95
3 PC/SET 15" x 1" x ⅛"	62.95
3 PC/SET 16" x 1" x ⅛"	65.95
4 PC/SET 20" x 1" x ⅛"	110.95
4 PC/SET 24" x 1⅛" x ⅛"	149.95

Carbide Tipped Available—$7 per inch

VISE CLAMPS Here's a great idea . . . vise clamps for your drill press! Now you can clamp the work down to the table and safely drill thru without the worry of lifting or throwing the work. Every drill press needs one!

6" VISE CLAMP . $ 9.95
9" VISE CLAMP . $15.95
11" VISE CLAMP . $19.95

SINGLEY SLEEVELESS DRUM SANDERS



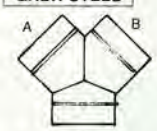
MADE IN U.S.A.
Illustration shows ½" Adapter inserted

Never buy sleeves again!! These drums are designed to use sandpaper cut from standard size sheets. Stocked in the following sizes: (less adapter)

¾" x 3"	$14.50	3" x 3"	$17.50	3" x 6"	$27.50
1" x 3"	13.50	2½" x 4½"	21.00	¼" Adapter	1.50
2" x 3"	15.50	3" x 4½"	22.50	½" Adapter	1.50
2½" x 3"	16.00	2½" x 6"	25.50		

DUST COLLECTOR ACCESSORIES
CREATE THE SYSTEM TO MEET YOUR NEEDS!!!

Y-FITTINGS GALV. STEEL



A	B	C	PRICE	MODEL
5"	5"	8"	$21.50	Y-85
6	6	8	22.00	Y-86
6	6	7	21.00	Y-76
5	5	7	20.00	Y-75
5	5	6	17.00	Y-65
5	5	5	16.50	Y-55
4	4	5	16.00	Y-54
4	4	4	16.00	Y-44
3	3	4	16.00	Y-43

REDUCERS GALV. STEEL

MODEL	PRICE
R-4-3	$ 9.50
R-5-4	9.50
R-6-5	10.50
R-6-4	10.50
R-7-5	11.50
R-7-6	11.50
R-8-5	12.50
R-8-6	12.50

SHUT OFF GATES CASTINGS

MODEL	PRICE
GA-3	$14.00
GA-4	15.00
GA-5	19.50
GA-6	24.00
GA-7	30.00

HEAVY DUTY REINFORCED PVC FLEX HOSE

MODEL	PRICE PER FT.	SIZE
BWFH-4	$2.50	4" DIA.
BWFH-5	3.55	5" DIA.

DML FACTORY SPECIALS

10" DML DELUXE INDUSTRIAL CARBIDE SAW BLADES	MADE IN U.S.A.
D1040 GA General Purpose 40 tooth ATB	$34.95
D1060 CA Cut Off. 60 tooth ATB	$42.95
D1060 CT Cut Off. 60 tooth TCG	$42.95
D1080 TA Trim. 80 tooth ATB	$51.95
D1080 TT Trim. 80 tooth TCG	$51.95
D1050 PL Planer 50 tooth MCT	$35.95

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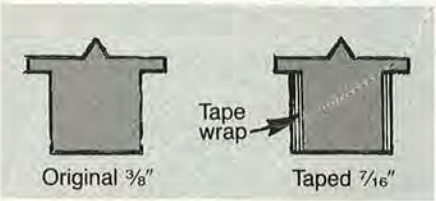
FITTING DOWEL CENTERS TO THOSE "ODD" REPAIRS

When repairing old furniture, you often run across odd-size dowels and dowel holes, such as 7/16", for example. What do you do if your dowel center set has none for that size?

TIP: Using the next smaller size dowel center, wrap electrical tape around it until it fits snugly in the hole, as shown in the drawing *below*. Wrap the tape carefully and evenly, so the point remains centered.

— Dan Miller, Elgin, Ill.



DEBUGGINC YOUR CABINETS

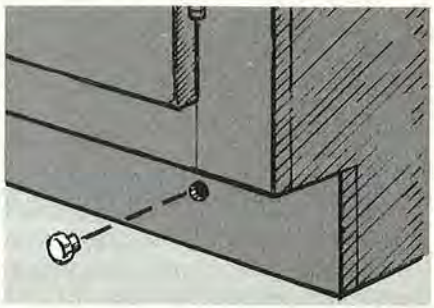
The space beneath baseboard-type cabinets becomes a popular hiding place for all kinds of household bugs. How can you get the little critters?

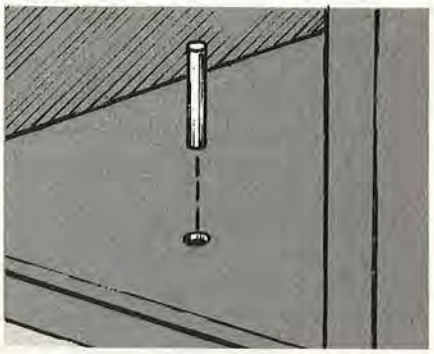
TIP: You have two choices.

1 Drill a 3/8" hole in the baseboard of each cabinet to allow application of your favorite bug killer. Then plug the holes with furniture dowel buttons. Don't glue them in place, so you can pop them out for future raids on the hideouts. Stain the plugs to match the cabinet.

2 Drill a 3/8" hole through the floor of each cabinet, apply the pesticide, then insert a dowel plug flush with the cabinet floor (dowel must fit snug in hole).

James D. Craig, Birmingham, Ala.





AEROSOL TOUCH-UP TRICK

Touching up small areas with aerosol paints can be touchy. If you aim the spray at one spot, the paint globs on the surface.

TIP: Through the center of a folded newspaper, cut a hole the size of the spot to be sprayed, then center the hole over the spot. Peak the fold slightly above the surface, and make several quick spraying passes across the hole. The moving spray will prevent paint from globbing in one spot, and the raised paper allows some of the residual spray to creep beneath and feather the edges.

— From the WOOD shop.

Do you have any good tips you'd like to share with our readers? We'll pay you $25 for each submission we publish. No shop tips can be returned. Mail your tips to:

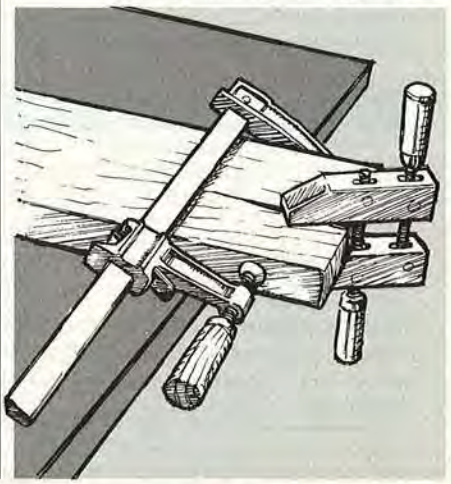
Shop Tips
Better Homes and Gardens®
***WOOD* Magazine**
Locust at 17th
Des Moines, IA 50336

ALIGNING A ROUGH BREAK

When gluing split or broken pieces back together, how do you keep the break perfectly alied during the clamping process?

TIP: First remove any loose splinters that will interfere with the fit. With a flat stick, spatula, or feeler-gauge blade, work the glue into the break. Then use a hand screw, or a combination of blocks and clamps, to align the adjacent faces, as shown in the drawing below. Finally, position another clamp at right angles to the break to pull it together.

Don Butler, Waterford, Pa.



Continued on page 16

freud® Savings in Sets

3 SAWBLADE SET

With the purchase of these 3 blades, you will not need to buy any other blades! You have a blade that gives you a glue line rip finish in the LM72M010. Another blade, the LU85M010, cuts with a "glass like" finish when cross cutting or mitering. The third blade, LU84M011, is your combination blade that is used when an extreme cross cut finish or production rate ripping is not needed.

		List	Sale
Set of 3 Blades		$272.77	$159.50
LM72M010	10 x 24 Flat	70.69	48.25
LU84M011	10 x 50 Comb	81.22	49.75
LU85M010	10 x 80 ATB	120.86	81.50

DADO

Freud Carbide Tipped Dado Heads produce a smooth and accurate groove when used running with the grain or across the grain. The standard dado cuts a maximum width of 13/16 inch. All blades and chippers are carbide tipped and sharpened to give you a long cutting life. The set contains 2 outside blades of 1/8" kerf, one 1/16" chipper, two 1/8" chippers and one 1/4" chipper.

		List	Sale
DS306	6" x 18 Dado Set	$160.12	125.00
DS308	8" x 18 Dado Set	196.09	135.00

94-100

Produce your own cabinet doors with this 5-piece router bit set at a fraction of the cost of shaper heads!!

These bits are individually balanced and designed to be used with a 1/2" table mounted router.

The bit profiles are: rail and stile, raised panel, door lip, and glue joint. All bits are precision sharpened for a long cutting life.

		List	Sale
94-100	5 Piece Router Door System	$248.00	$199.00

EC-900

Produce professional quality cabinet doors with this 5 piece set of cutter heads designed for your 3/4" - 1/2" spindle shaper. These heads are sharpened with a 600 grit diamond wheel for an extremely sharp edge. One half inch bushings standard.

The shaper head profiles are: Rail & Stile, raised panel, door lip, and glue joint.

		List	Sale
EC-900	5 piece Shaper Set	$489.41	$380.00

90-100

This 15 piece router bit set offers you a great variety of useful bits from "V" grooving and flush trimming to chamfering and dovetailing. All bits are solid carbide or carbide tipped and are ground to a razor sharp edge. Profile bits have a shear face for an extremely smooth finish.

All bits have a 1/4" shank.

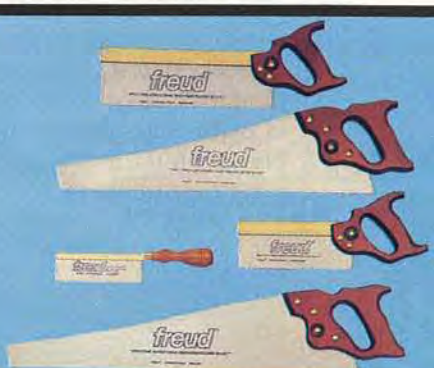
		List	Sale
90-100	15 pc. Router Bit Set	$249.61	$199.00

FB-100

These Forstner bits will produce a flat bottom hole and bore any arc of a circle at any angle thus allowing you to make pocket holes. A special heat treated steel is used in their production to assure long lasting edges.

The 16 piece set includes bits from 1/4" to 2 1/8" inclusive in 1/8" increments.

		List	Sale
FB-100	16 pc. Forstner Bit Set	$249.00	$199.00



HAND SAWS

These hand saws are made in Sheffield, England out of their finest steel to give you high performance and durability. These high quality blades are flexible but will always return to true.

The collection of 5 saws (rip, panel, tenon, dovetail, gent's) will meet all of your hand saw needs. They are precision balanced, thus letting the saw work with you. The lacquered English red beech handles are designed to make your precision sawing comfortable.

		List	Sale
Set of 5 Hand Saws		$102.51	$ 73.50
RS024	24" x 7 points	22.21	16.50
PS022	22" x 10 points	20.93	18.25
TS012	12" x 15 points	26.71	21.25
DS008	8" x 20 points	23.46	19.25
GS006	6" x 15 points	9.20	8.25

DB-050

This 50 piece set consists of: A) 25 high speed steel bits (1/16" - 1/2" in 1/64" increments) B) 4 high speed steel bits for sheet metal (1/4, 3/16, 1/8, 3/32) C) 6 chrome vanadium steel brad point bits for use in wood (1/8, 5/32, 3/16, 1/4, 5/16, 3/8) D) 6 carbide tipped masonry bits with hex shanks (5/32, 3/16, 7/32, 1/4, 5/16, 3/8) E) 1 center punch, 1 Allen key and 6 depth stops.

These bits fit any stationary or portable drill using 3/8" or larger chuck.

		List	Sale
DB-050	50 Piece Drill Bit Set	$ 89.00	$ 69.00

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Complete satisfaction guaranteed. Send for your Mercedes Benz kit today for only $19.95 and receive a two blade stainless steel pocket knife absolutely ***free.*** If you are not completely satisfied, keep the finishing materials, map case and pocket knife, simply return the car kit for a full refund. Keep the Mercedes Benz and you will become a certified member of the Vintage Car Club of America and have the opportunity to purchase, if you wish, additional quality Car Kits on a monthly basis. However, you are not obligated to buy any additional kits — ever!

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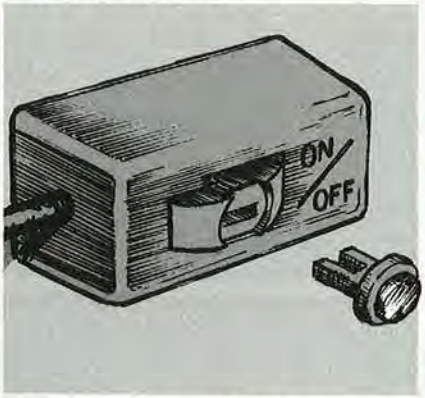
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 14

TWO GOOD USES FOR HOBBY MAGNETS

Many new stationary power tools have removable locking switches or keys. Unfortunately, most of them won't attach to your key ring. So, where to put them?

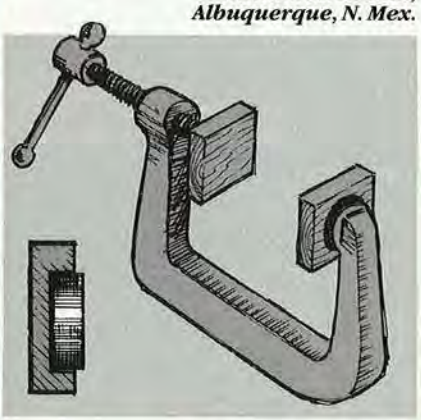
TIP: Epoxy a round hobby magnet to the switch or key and attach it to an inconspicuous metal part of the tool, such as under the table or metal stand. Now, you're less likely to lose the key.



When using clamps, it's a good idea to sandwich wood spacers between the jaws and project to keep from marring it. But how do you keep the scraps in position while tightening the clamp?

TIP: Recess small, round hobby magnets into 2" squares of ½" plywood. Drill the recess holes just deep enough so the magnet projects slightly above the face of the block, then epoxy the magnet in place. The magnets hold the blocks on the clamp jaws while you're clamping.

William M. Resnik, Albuquerque, N. Mex.



Continued on page 18

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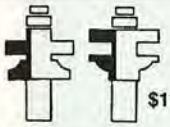

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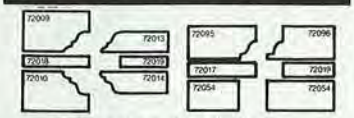

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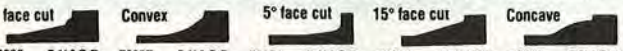

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72086	5-½" O.D.	72087	5-½" O.D.	72031	5-½" O.D.	72084	5-½" O.D.	72085	5-½" O.D.
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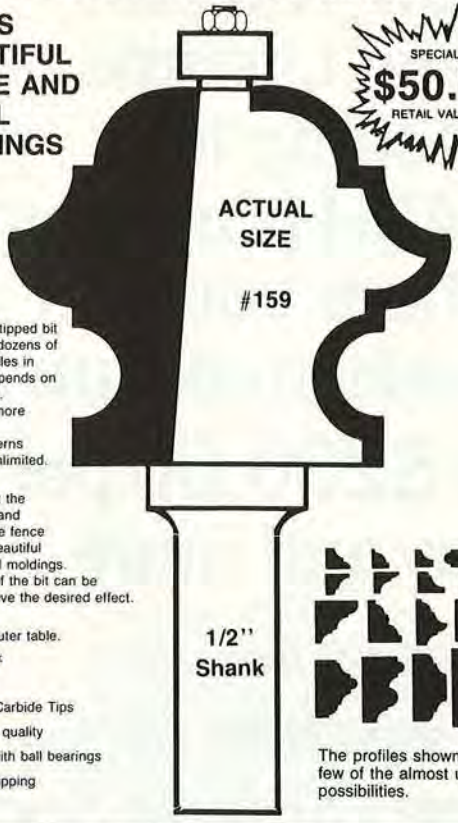

This carbide tipped bit will produce dozens of different profiles in one pass (depends on size of stock). With two or more passes, the possible patterns are almost unlimited.

Simply adjust the depth of cut and position of the fence and create beautiful large or small moldings. Any portion of the bit can be used to achieve the desired effect.

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TIPS FROM YOUR SHOP (AND OURS)

Continued from page 16

KEEPING RUST AT BAY

Rust can take its toll on tools, especially if you store them in an unheated shop or garage where humidity varies widely.

TIP: Place small packets of desiccant (silica gel) in toolboxes and carving cases to absorb rust-causing moisture as it forms. Collect these packets from cans of coffee, packaged camera equipment, and other store-bought items sensitive to moisture damage. You can give the desiccant packets new life by drying them in your oven.

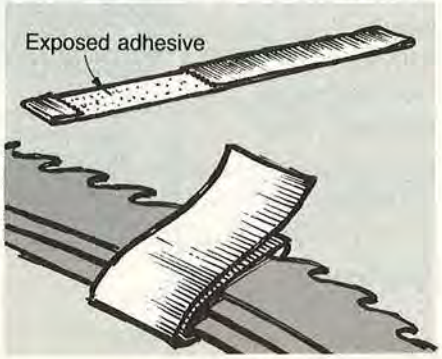
—John C. Monaghan, Goleta, Calif.

STICK-FREE TAPING

When you're using tape for securing various items, the adhesive backing often sticks to the items being taped.

TIP: Fold back a section of tape, with the adhesive sides facing each other. Make this section slightly longer than needed to loop around the items you're securing. Leave several inches of the adhesive exposed to secure the loop.

— Chester Beintema, W. Covina, Calif.



PUTTING A TIGHT LID ON FINISHES

When you apply paint or varnish directly from the can, the material often collects in the channel of the can rim, preventing a tight seal or spattering the finish when you replace the lid.

TIP: Use a nail to punch small holes in the channel. This allows the finish to drip back into the can while you're using it, so you get a tight seal with no spatter.

From the* WOOD *shop.

Continued on page 23

Escape to the pleasures of woodworking

What do you ask for from your leisure time? Fun, of course. Maybe a chance to do something nice for yourself, too. And certainly, to get away from the pressures of the job.

Consider woodworking. It can give you all these and much more. More easily and for less than you think.

For one thing, it's enjoyable. You start with only an idea, some wood and your tools. You combine the three to fashion something uniquely your own. Before long, you have a stereo cabinet, a platform bed or maybe even a wall unit, made with your own hands.

Woodworking — a great way to get away from it all.

At the same time, as you lose yourself in the intricacies of the project, an amazing thing happens. The details of work recede into the background, then disappear. Your mind clears and you finish more refreshed than when you started.

At the same time, the pieces you make improve the quality of your life. The wine rack, bookcase and clothes tree all add a little warmth to the old home or apartment — for a lot less than you'd pay in a store.

Let Shopsmith® show you the way.

That's where Shopsmith comes in. We have the woodworking system and accessories plus the know-how to make your workshop as enjoyable as possible.

Take the Shopsmith MARK V, for instance. Quite simply, it is the best multi-purpose woodworking system available. It lets you do more for less than any single function accessory. Its table saw, vertical drill press, horizontal boring machine, lathe and disc sander have precision built in so your work comes out right the first time. You get all these functions in one compact unit so the MARK V can fit right in, even if space is a problem.

Plus all the accessories and know-how you need.

The MARK V is only part of the Shopsmith story. You'll also find almost every woodworking product and accessory you need available either through the convenience of shopping by mail, TOLL-FREE phone or in the Shopsmith Store near you.

Your satisfaction is our goal.

We back all our products with an ironclad guarantee and warranty. There's a toll-free number you can call with your woodworking questions and problems. We're committed to your woodworking education through owner's manuals, classes, seminars, magazines and catalogs. All this is part of the Shopsmith Difference.

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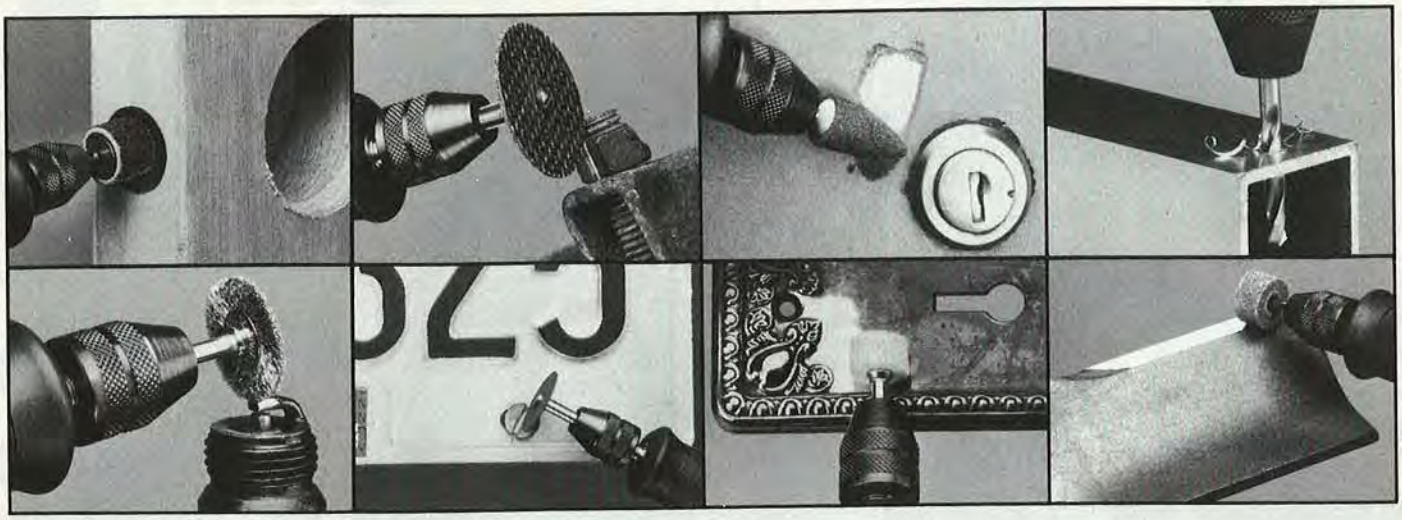

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If the surface is metal, the Moto-Tool is perfect for the job. Like sharpening your lawn mower blades quickly and easily. Right in the back yard without having to remove any parts. Simply drop in the grinding stone and let the Moto-Tool's 30,000 RPM do all the work.

That's the kind of powerful speed you need in the garage to remove rusty screws from a license plate. And the kind of compactness it takes to do the job in a hard-to-reach place. Just slip in the cut-off wheel to reslot the screws. Or use the same bit to cut them off in seconds. The Moto-Tool does whatever it takes.

That goes for working under the hood, too. Use the wire brush to clean corroded spark plugs and dirty metal parts. The Moto-Tool turns this task into a quick clean-up.

It masters do-it-yourself projects all over the house with just the change of a bit. The same tool you used today to cut copper tubing, you can use tomorrow to safely polish antique brass. Now that's versatility.

The Dremel Moto-Tool. Put it to the task for all the tasks you want to put behind you.

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PRODUCTS THAT PERFORM

Print this article

Here at *WOOD*, we're always looking for products that make life in the woodshop a bit easier, or make a project a bit nicer. When you find a product that really works for you, you tell your friends, right? That's the purpose of this column. We don't always feature the newest products on the market, but ones we think you, as a woodworker, will be interested in. And we test all of them to make sure they meet *our* standards of performance: we hope they'll meet your requirements, too.

NEW USE FOR A FAMILIAR PRODUCT

If you're tired of cleaning gummed-up circular saw blades by the traditional method—soaking them overnight in kerosene or a similar noxious solvent—there's a quicker, easier way. Give the blade a few squirts of Formula 409 All Purpose Cleaner, brush lightly with a bristle brush, and wipe clean with a soft cloth. You'll be surprised how quickly the pitch and gum dissolves off the blade. Really gummy blades may require a second application. If you already have a spray bottle of Formula 409 in with the household cleaning supplies, preserve family harmony—buy another bottle for the shop!

Formula 409 All Purpose Cleaner, distributed by The Clorox Company. We paid about $2.50 for the 22-ounce size spray bottle at a local supermarket.

TWO KNIVES YOU CAN PASS DOWN TO YOUR GRANDKIDS

These classic three-blade whittler pattern knives refute the old expression, "They don't make 'em like they used to." You'll find that the Camillus (top) and the Boker Tree Brand Classic (bottom) are two knives with an heirloom quality you can see and feel.

The German-made Boker has a 2⅜" sabre clip master blade, 1¼" pen blade, and 1¼" coping blade, solidly constructed from chrome-vanadium alloy steel. It also features a comfortable 3½" wood-inlaid serpentine handle with nickel-sliver pins and bolsters, and machined-brass linings.

The American-made Camillus has high carbon steel blades—a ⅜" sabre clip master blade, 1½" pen blade, and 1⅜" coping blade. The 3⅝" swelled-center handle fits comfortably in the hand. It also features nickel-silver bolsters and pins, and brass linings.

After trying these knives, our woodcarving consultant Harley Refsal commented, "Both knives are entirely usable for general carving or whittling. The blades take and maintain a keen edge, and contain plenty of steel in case you want to grind one or two of the blades into specialty shapes for a specific type of carving."

But you don't have to be a carver or whittler to appreciate these fine pocket knives.

Boker Tree Brand Classic knife (cat. no. 17C51) $29.95 ppd; Camillus knife (cat. no. 17C41) $14.95 ppd. from Woodcraft Supply Corp., 41 Atlantic Ave., Box 4000, Woburn, MA 01888.

Continued on page 25

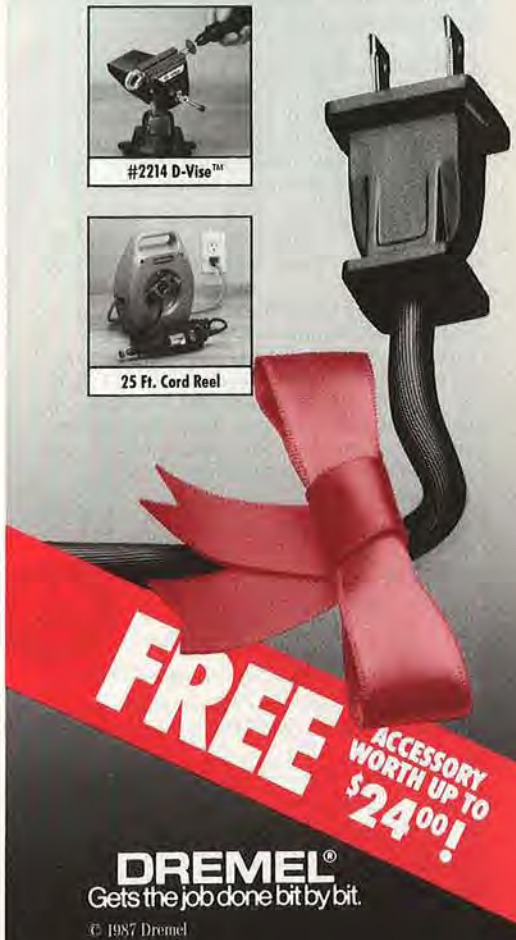
THERE'S NO END TO WHAT IT DOES FOR YOU.

Buy a specially marked 3950 Moto-Tool® Kit between now and December 31st and receive a free gift worth up to $24.00. Choose any one of the top quality accessories shown here. Each would make a valuable addition to your workshop. With the Moto-Tool and a free accessory, there's no end to the tasks you can master. See your dealer for complete details.

#2217 Moto-Tool Holder

#2214 D-Vise™

25 Ft. Cord Reel



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4510.1	4 oz. Waxlit	$ 7.95
4510.2	24 oz. Waxlit	$28.00

B / Our 202GF Gap Filling Glue Has Remarkable Properties
It has a high solids content so that small gaps on your joinery are actually filled – with strength. And the "squeeze-out," where it is not pressed into the wood, beads right up and chips off when dry. No soaking in to ruin finishes. Dries to light tan. Water clean-up.

62J01.01	1 pt. 202 GF	$ 6.25
62J01.03	1 qt. 202 GF	$10.95

C / Turn Your Router Into A Small Scale Shaper
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		List Price	*Special Offer*
8200	Standard Set	$206.95	$166.90
8210	Deluxe Set	$325.80	$265.80

D / Handy Glue Syringes
Set of three, works with most glues.

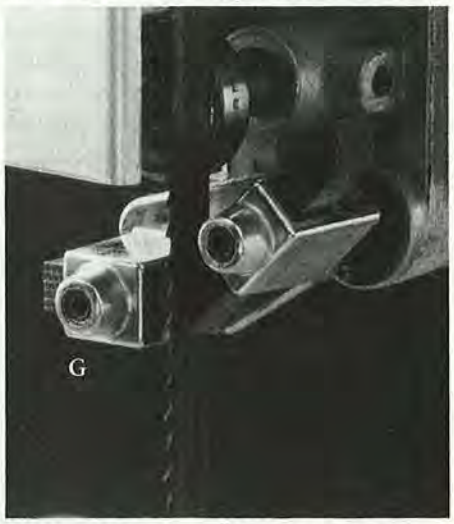
62J04.08	3 Glue Syringes	$3.95

E / Special Cabinetmaker's Skew Ground Chisels Provide A Slicing Finishing Cut
Available in Right and Left Hand pairs Nothing surpasses these when cleaning up the corners of difficult joints or trimming next to adjacent surfaces.

37S01.01	Pair ½" Skew	$17.65
37S01.02	Pair ¾" Skew	$18.65
37S01.03	Pair 1" Skew	$19.95

F / Folding Dozuki Protects The Saw Blade
Ideal for any toolbox. The deep blade is flexible for flush cuts and the 18 tpi pattern fine enough for trimming out. 9" Blade folds neatly to fully protect the blade.

49I16.05	Folding Dozuki	$22.60



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TIPS FROM YOUR SHOP (AND OURS)

Continued from page 18

STAYING IN THE SLOT

It's frustrating when a screwdriver keeps jumping out of the screw slot when you're trying to drive flathead wood screws. At worst, the screwdriver chews up the slot, or slips, marring the wood. If you're using the correct-size screwdriver with a good, square tip, and you're still having problems, try this trick:

TIP: Before installing, place the screws in a vise, being careful not to damage the threads. Then use a hacksaw to increase the depth of the screw slot. This will give the screwdriver more bite. ***Note:*** The width of the hacksaw blade and the existing screw slot should match closely. This trick won't work well with all screws, especially some larger ones.

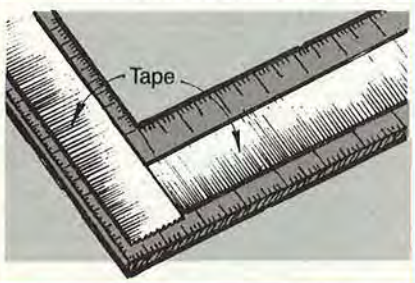
— Joe Fantacone, Philadelphia, Pa.

SCRATCH-FREE GLASS CUTTING

A steel framing square would make an excellent straightedge for cutting glass, except that it tends to slide around while you're cutting.

TIP: Attach a single layer of masking tape or duct tape to the side of the square that will contact the glass. Choose a width slightly less than the width of the square legs. The tape prevents both slippage and scratching. ***Note:*** Place the glass on a smooth, flat, solid work surface before cutting.

— Ruben Pauly, Alliance, Nebr.



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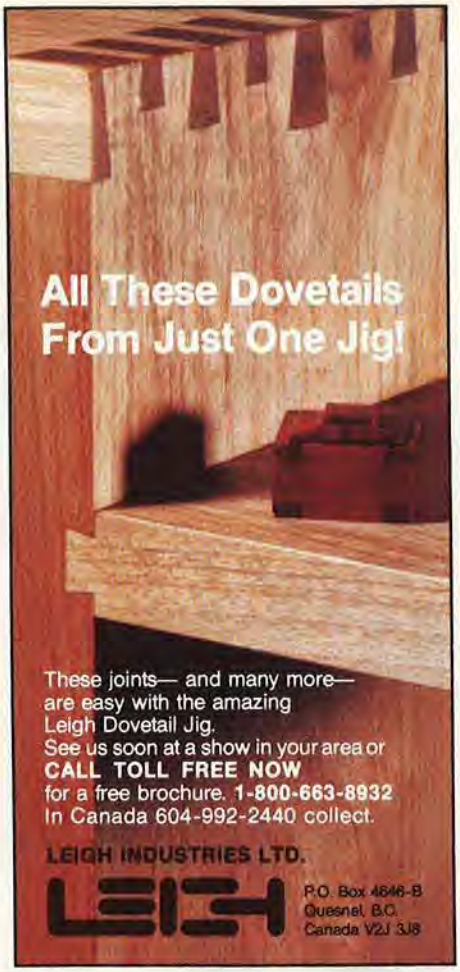

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6 x 1	12.11	1.84	10 x 1¾	21.73	3.16
6 x 1¼	12.89	1.94	10 x 2	22.79	3.31
6 x 1½	13.85	2.08	10 x 2¼	26.51	3.82
			10 x 2½	26.51	3.82
8 x ¾	11.37	1.74	10 x 2¾	28.75	4.13
8 x 1	12.37	1.87	10 x 3	33.35	4.76
8 x 1⅛	13.31	2.00	10 x 3½	36.23	6.47
8 x 1¼	13.59	2.04	10 x 4	39.58	7.05
8 x 1½	16.07	2.38	10 x 5¼	59.49	10.51
8 x 1¾	17.07	2.52			
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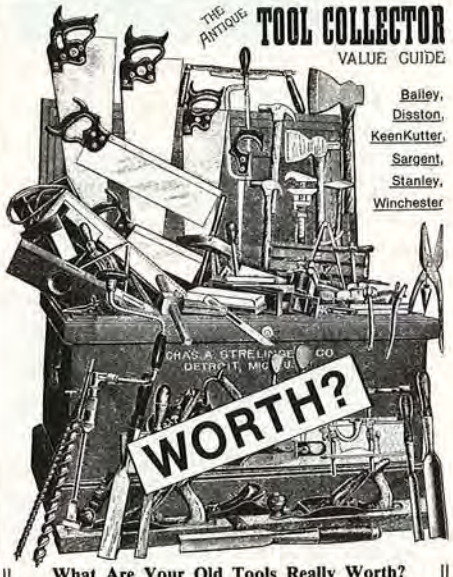

What Are Your Old Tools Really Worth?

Old woodworking tools are one of today's hottest new areas of collecting. Long neglected by all but a few sophisticated insiders, this field is growing rapidly. Several Stanley-Bailey carpenter planes are already selling in the $500-$900 range, and an early plow plane sold for over $6,000 at a recent tool auction. **Ronald Barlow has spent the last 3 years working full-time on this guide...**amassing photographs, and recording dealer and auction prices from all over the world.

Antique Tool Collector's Value Guide

Just a few of the **over 5,000 items described and priced:** adzes, anvils, axes, trade catalogs, braces, bitstocks, chisels, cobbler's tools, coopers items, compasses, dividers, hammers, hatchets, knives, lathes, levels, planes, pliers, plumb bobs, routers, rules, saws, scorps, screwdrivers, shears, spoke shaves, surveying instruments, tinsmiths tools, trammel points, wrenches, and wheelwright's items. **Over 2,000 illustrations.** 1st Ed. • 230 pgs. • 9X12 paperback • Library of Congress #84-50055.

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PRODUCTS THAT PERFORM

Continued from page 21

CUSHIONY SOFT SANDING

We've seen several inflatable contour sanders in the past few years, but the Cushion Contour Sander incorporates a nice improvement. It's the first one we've tested with spindles to attach *both ends* of the 8" inflatable sanding drum to a lathe or drill press. The spindles solidly support both ends of the 8"-long sanding drum. Attached to a variable-speed lathe or drill press the sander has even greater sanding flexibility. You can quickly remove a lot of stock at higher speeds with coarse sanding sleeves, then slow down the drum to prevent burn marks when using finer grits.

To use, you inflate the drum with a few bursts from an ordinary bicycle pump (you can order one from the manufacturer).

Cushion Contour Sander; 3"-diameter drum, lathe and drill press attachments, and five sanding sleeves, $69 postpaid. Additional sanding sleeves, $1.40 each; 2", 4", and 6" drums also available. For bicycle pump add $3. Order from Industrial Abrasives Co., 642 N. Eighth St., Reading, PA 19603.

WESTERN-STYLE HANDSAW WITH A JAPANESE BITE

Do you like the fast cutting action of Japanese-style saws, but can't quite get the hang of using one? The Nakaya Hand Saw offers the best of East and West — a Japanese tooth pattern on a Western-style saw.

At 7 tpi (teeth per inch), the Nakaya rips and crosscuts through wood like a hot knife through butter. The manufacturer claims it will cut ⅓ faster than a conventional 8-tpi panel saw.

The teeth have three ground faces instead of two. Each tooth is cut at a slightly different angle, which gradually increases from 10° at the heel to 16° at the toe. This causes the teeth to bite more aggressively as you increase the stroke length. (Unlike traditional Japanese saws, this one cuts on the push stroke.)

The unusual set of the teeth require hand-sharpening with a special file and fence that you order with the saw.

Nakaya Panel Saw no. 49I20.01, $33.90 postpaid from Garrett Wade Co., 161 Avenue of the Americas, New York, NY 10013. Special file and fence no. 49I20.02, $5.25 with saw order.

Continued on page 26

Continued from page 25

GETTING A HANDLE ON COMFORT

If you've ever found a tool uncomfortable — even painful — to hold after using it awhile, you can bet that the manufacturer didn't have a good grasp of *ergonomics* (otherwise known as human-factor engineering). Bahco, a Swedish tool manufacturer, hired ergonomics specialists to design the Bahco Ergo chisel to reduce wrist and hand strain. We found that the long, tapered handle provides a firm, comfortable, nonslip grip when used with one or both hands. The handle design and overall balance of the tool allow precise control over the blade in a variety of work situations. We especially like the angle of the blade in relation to the handle. The angled blade enables you to apply much more force with greater accuracy when making shallow paring cuts. Overall, this chisel just plain feels good in your hand.

The chisel's impact-resistant polypropylene handle carries a liftime guarantee. Other Bahco Ergo tools include screwdrivers, pliers, and several sizes of adjustable wrenches.

Seven widths of Ergo chisels (¼" to 1¼") from $13.67 to $17.54 through woodworking mail-order catalogs and some retail outlets. For a list of distributors in your area, send inquiries to Seraqua Trading Co., 4099 Landisville Rd., P.O. Box 1289, Doylestown, PA 18901. 215/345-6212.

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2-Step Sealacell System, Step 1 and Step 2 products $4.25 half-pint, $5.50 pint, $7.95 quart (plus shipping) from General Finishes Corp., P.O. Box 14363, Milwaukee, WI 53214. For additional information call 414/774-1050.

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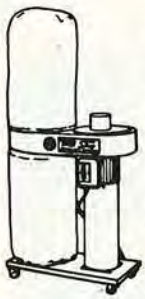

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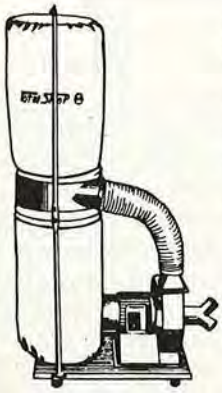

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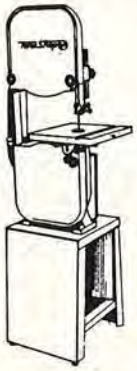

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The well-dressed woodworker

Print this article

When you go out on the town, you put on a good set of clothes, right? But, if you go jogging instead, would you wear the same clothes? Of course not. Being properly dressed in the shop can prevent an accident.

No loose-fitting clothing.
If you wear a long-sleeved shirt, button the cuffs. If you roll your sleeves up, roll them past your elbow. Better yet, switch to a short-sleeved shirt. Always wear shoes, preferably steel-toed ones, when working in the shop.

Protect your eyes, nose, and lungs.
Wear safety goggles with side shields when using power tools. If you wear glasses, you may find a face shield less of a hassle to wear. We find the face shield especially good when using a tool (such as the lathe) that throws chips back into your face.

Wear a dust mask to protect against nontoxic airborne irritants; a cartridge-type respirator when working with finish containing volatile solvents. Remember: Dust masks provide *no* protection against fumes from organic-type solvents.

Get into the habit of wearing hearing protectors. Use one you feel most comfortable wearing.

Bodies need protection, too.
A cloth apron should be adequate for all-around use. But for greater protection, consider a leather apron. Finishes and solvents require a moisture-proof apron.

Have several different kinds of leather or cloth gloves if you handle rough lumber. Wear light-duty plastic gloves for chores such as applying an oil finish. But, reach for heavy-duty vinyl gloves whenever refinishing.

Illustration: Jim Stevenson

It can do so much, it's almost unfair to call it a sander.

The new Delta 1" Belt Sander is so handy that no shop should be without one. And at only $69.95, just think what a great Christmas gift it'd make for your favorite woodworker or hobbyist. Or for yourself.

You can use it to sand, grind, deburr, contour, sharpen, buff, or polish just about any material. It uses standard 1" x 30" abrasive belts. And there's a power take-off for mounting an accessory flexible shaft with attachments that can do dozens of extra jobs.

In fact, our new 1" Belt Sander does so many things so well, you may wonder how you ever got along without it.
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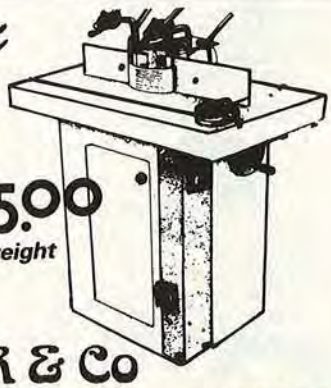

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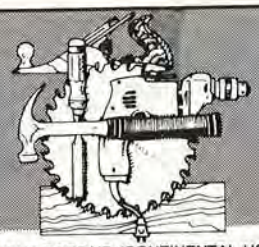

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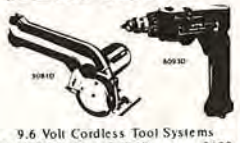

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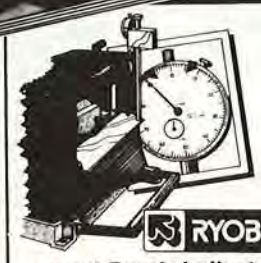

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Print this article

I *Keep your carving tools sharp.* Sharp tools cut wood with a minimum amount of pressure. A dull blade or edge requires more of your muscle to tear its way through the wood, thereby decreasing your control and increasing the chance of injury.

II *Hands belong behind sharp edges.* When you are carving, every so often stop and ask yourself, "If my knife or gouge were to slip, where would it go?" Whittlers or figure carvers typically hold the piece with one hand and carve with the other. Always be sure to have your "holding hand" *behind* the cutting blade. Hold gouges firmly with both hands to minimize any chance for injury. And, keep the blade edge or gouge tip going away from you.

III *Control your cut.* In handheld carving, many carvers also use their knees as a vise to help hold the wood, which isn't as dangerous as you think. That's because you control a whittling or bench knife by holding the knife with the power hand while pushing on the back of the blade with the thumb of the other hand. This method eases the blade through the wood. It may seem

Continued on page 31

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SHOP SAFETY

Continued from page 29

awkward at first, but with practice, pushing the blade proves to be very safe and effective. And, don't try to take off too much wood at a time. Carving too deeply can damage you and your carving.

IV *Secure large workpieces.* When carving large, three-dimensional pieces or plaques in relief that have a tendency to slide, attach the wood to your bench. Carver's screws, various types of woodcarving vises, or large wooden clamps will hold the wood securely in place. For the pounding that goes with gouge and mallet work, you'll find clamping your work a must.

V *Wear protection.* A leather apron or a heavy-duty shop apron of denim or duck give you peace of mind and can deflect misdirected cuts. For more protection, wear a carving glove on your holding hand. Made of interwoven strands of a nylon/fiberglass material and stainless steel, a glove proves virtually impossible to slice through with a knife blade. Yet, due to the fairly loose weave, a direct stab can puncture.

VI *Keep your work area free of clutter.* Knives and gouges lying around your carving bench or work area invite cuts and nicks as you reach for another tool. Keep them within easy reach, but out of the way while working. Lying helter-skelter, tools bump into one another and quickly lose their sharp cutting edges. Always line up gouges or knives so they can be picked up by the handles, not the blades. If you hand a tool to someone else, hold onto the blade end and offer the handle.

VII *Don goggles and a mask with power tools.* Power carving tools, such as the Foredom or Dremel, produce flying chips, then fine dust. Wear safety goggles, and after the chips stop flying, don a dust mask.

Illustration: Jim Stevenson

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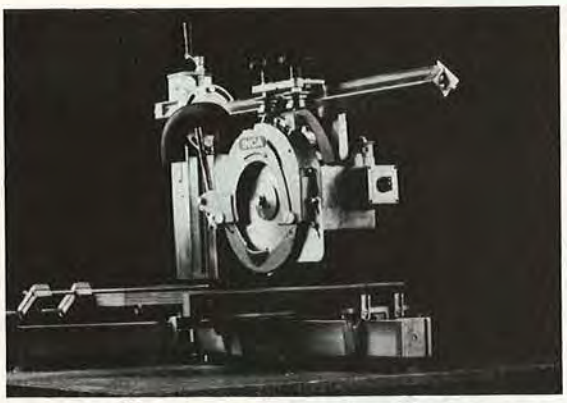

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THE MAGAZINE FOR HOME WOODWORKERS
DECEMBER WOOD 1987
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BALD CYPRESS

The enduring beauty of the bayou

A cousin to the huge redwood and giant sequoia, the bald cypress easily ranks as the largest and longest living tree east of the Mississippi. Thousand-year-old, first-growth trees attain 150′ heights and diameters of 12′. In fact, bald cypress of this size have yielded 100,000 board feet of lumber per acre! However, typical stands average no more than 10,000 board feet.

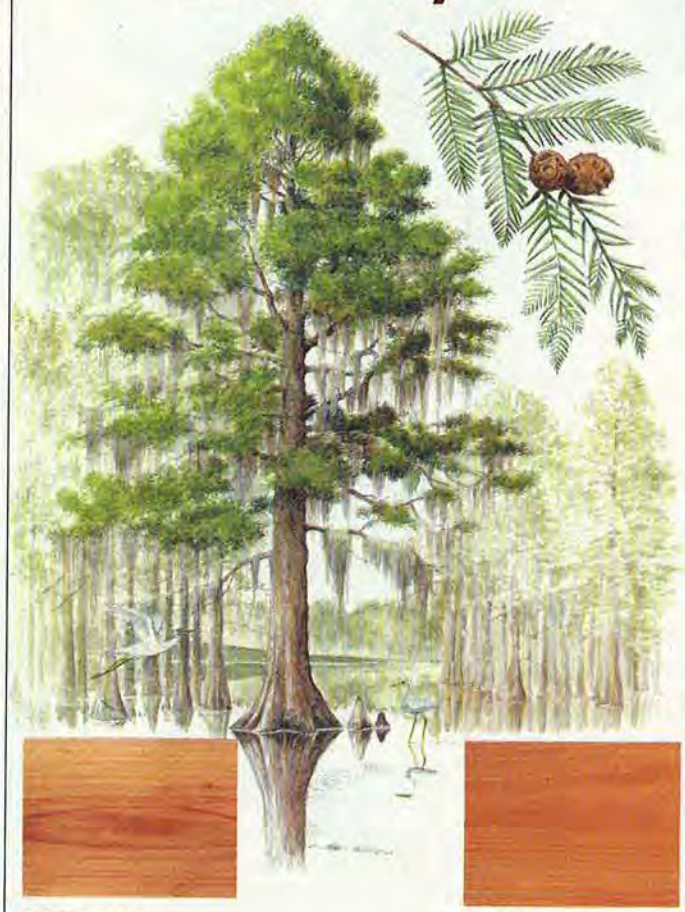
Today, such huge, ancient trees are a rare find. Loggers locate some by probing the bottoms of swamps. These still sound prizes — sunk long ago by clearing or storm — must be dredged from the water, then airlifted to the sawmill.

Resistance to decay makes even the smaller, second growth bald cypress ideal for outdoor construction. Yet, its attractiveness lends itself to indoor projects, too.

Wood identification

The bald cypress (*Taxodium distichum*), classified as a conifer, acts like a hardwood by turning brown or golden in the fall before dropping its needles. Immature trees form a conical shape, have thin, light brown bark, and look much like any other conifer. As a bald cypress ages, however, it begins to more closely resemble a hardwood.

Its trunk tapers and develops broad supports called *buttresses* at the base. The bark turns reddish brown, becomes deeply ridged, and peels. At maturity, bald cypress trees have large, uplifting branches forming a broad, irregular canopy.



Bald cypress heartwood

Bald cypress sapwood

Bald cypress prefers wet feet, and grows well in damp bottomlands and swamps from Delaware to south Florida, and along the Gulf Coast into Texas. Northward, it hugs river valleys through Oklahoma and Arkansas, and up into Illinois and Indiana.

In swampy areas, bald cypress grows in stands. To help anchor the tree in a fragile bottom, its roots develop above-water shoots or knees for support. On drier ground, bald cypress mixes with hardwood species.

The wood weighs a bit less than walnut at 28 pounds per cubic foot dry. It has a yellow to pale-brown to reddish hue, and sometimes attractive figure. Bald cypress also feels slightly greasy or waxy. Heartwood has a peculiar, unpleasant odor.

Working properties

Bald cypress wood rates as moderately hard, strong, and stable, with straight, close grain. Although fairly light, the wood holds nails and screws well. It also feels resinous, but this does not affect gluing.

Bald cypress works easily with both hand and power tools. And, the wood sands smoothly and grabs on to finishes quite tenaciously.

Uses in woodworking

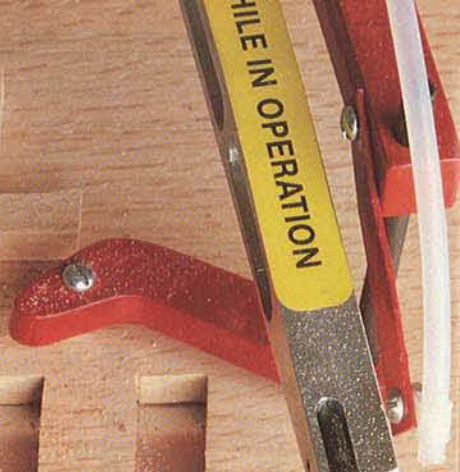
You can use bald cypress successfully for both indoor and outdoor projects. It works for furniture, paneling, cabinets, doors, windows, siding, decking, and trim. Boatbuilders find bald cypress excellent for planking, and farmers use it for barn boards, water troughs, and fences.

Cost and availability

In the South and southeastern United States, you'll find bald cypress at lumberyards. In other areas availability will be limited due to high shipping cost and the competition from western red cedar. Where you find it, bald cypress will cost about $1.50 per board foot. *Faux satine crotch,* a scarce veneer made from bald cypress crotch wood, occasionally shows up for commercial use in fine-furniture pieces and wall paneling.

Illustration: Steve Schindler
Photograph: Bob Calmer

6 FUN-TO-DO SCROLL SAW TECHNIQUES



Print this article

'Tis the season for scroll-sawing wooden tree ornaments, decorations, and holiday gifts. But maybe you're tired of cranking out the same old cookie-pattern cutouts on your scroll saw. We are. So this year we decided to have some real fun with our saw. Also, we wanted to turn out some scroll-sawn gifts that would make our friends and relatives say "HO-HO!", not "ho-hum". In the process, we came up with six neat scroll-saw techniques. We hope they'll spark your imagination — for holiday gifts, and projects the year-round.

Our Gift To You: We'll give you a set of full-size patterns for the projects illustrating these techniques, free for the asking. Just send a self-addressed stamped envelope to:
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LADIES AND GENTLEMEN, CHOOSE YOUR BLADES

The chart at *right* lists the best blade sizes for the techniques shown in this article, *provided* you use the stock thicknesses suggested in the chart and in the text.

If you use thicker material, select a wider, thicker blade with fewer teeth per inch. For thinner material, use a narrower, thinner blade with more teeth. Likewise, if you're cutting an intricate pattern with lots of sharp curves, use a narrower blade than is ordinarily recommended for the thickness of stock you're cutting. The reverse is true if you're cutting straight lines, or patterns with gentle curves.

***CAUTION:** Some of the photos in this article show the saw's hold-down foot elevated so you can better see what's going on. But we recommend you keep the foot in its proper position — down against the stock — while making all cuts. On most scroll saws, the foot not only holds the stock firmly against the table while you're cutting, but also serves as a blade guard to protect your fingers from the blade.*

Technique	Blade*		
	W	T	TPI
1. Wooden Puzzle	.037-.040	.015-.016	13-14
2. Scroll-Saw Puzzle	.029-.032	.012-.013	18-20
3. Relief Technique ¾"-1" stock	.053-.063	.018-.019	9.5-11.5
4. Inlay Technique ¼"-½" total thickness	.037-.043	.015-.016	12-14
5. Wood Sculpture ¼"-⅜" stock ½"-¾" stock	.037-.040 .043-.053	.015-.016 .016-.018	13-14 11.5-12
6. Stack Cutting ⅜"-¼" total thickness	.029-.032	.012-.013	18-20

*W-width, T-thickness, TPI-teeth per inch

***Note:** We chose these blade sizes based on their ability to make tight, intricate cuts in the stock thicknesses indicated. Use wider blades for simple patterns and straight-line cutting.*

1 SCROLL-SAWING WOODEN PUZZLES FOR TINY TOTS

Brightly colored, durable wooden puzzles fascinate young, growing minds. If you're making the puzzle for a preschooler, choose a pattern your little gift recipient will easily recognize.

1 With a pen or pencil, divide the pattern into puzzle segments—eight to 10 easily identifiable pieces should do for most puzzles.

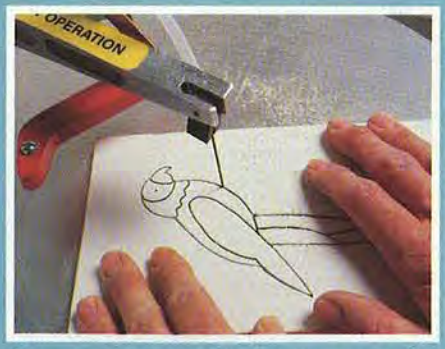
2 Cut a square or rectangular piece of ¼" birch plywood large enough to provide a ½" to 1" margin around the pattern. (This piece forms the puzzle parts and frame.) Then, from ⅛" birch plywood or hardboard, cut a piece the same size as the frame for the frame backing.

3 Center the pattern on the frame, then attach it with artist's spray-mount adhesive. Drill a hole in the frame just large enough to thread the scroll saw blade through it, insert the blade, and cut out the overall pattern shape, as shown in the photo *upper right*. Now, detach the blade from the saw arm and remove the frame and cut-out pattern piece.

4 Reattach the blade. Cut the pattern piece into individual puzzle parts, as shown in the photo *lower right*. Remove the paper pattern from the individual pieces.

5 Glue the backing piece to the backside of the frame. After the glue dries, sand the frame and puzzle pieces with 220-grit sandpaper, rounding over the edges slightly.

6 Use nontoxic paints to paint each puzzle piece a different color, and a clear nontoxic finish for the frame.



Mount your paper pattern on the wooden puzzle frame. Then, cut around the puzzle outline.

Cut the puzzle into individual parts, sand the parts smooth, and paint them bright colors.

2 HOW TO MAKE SCROLL-SAW PUZZLES FOR KIDS OF ALL AGES

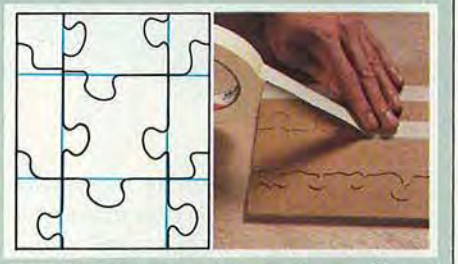
Sure, most people do call them jigsaw puzzles. But we call them scroll-saw puzzles because you can't beat a scroll saw for cranking out a lot of them in a hurry. Here's how to do it:

1 Cut out a suitable print, poster, or magazine photo, and glue it to a backing of ⅛" hardboard. (We found that an all-purpose spray adhesive, such as Touch 'n Stick or 3M Super 77, works well.)

2 With a straightedge and grease pencil (we used a white one), draw light grid lines on the puzzle face to indicate the size and number of puzzle pieces you want.

3 Cut the pieces freehand, using the grid lines as a general guide. Cut each puzzle piece so it interlocks with the adjoining ones, as shown in the sketch *upper right*. Make all of the lengthwise cuts first. Then, flip the puzzle upside down, and tape the strips together, as shown in the photo *upper right*. Now, flip the puzzle back over and make all the crosswise cuts.

4 Remove the grease-pencil marks by wiping *lightly* with a soft cloth dampened with lighter fluid. Don't rub too hard or the fluid may also remove the ink from the picture.



Glue the picture to the puzzle, mark grid lines, and make all lengthwise cuts. Then, flip the puzzle over and tape the cut lines together with masking tape.

The tape holds the puzzle together while you make crosswise cuts to separate the individual pieces.

Continued

3 GIVE YOUR NEXT PROJECT A BIT OF RELIEF

Need a gift for your Aunt Martha? She'll surely make room on the wall for a lovely scroll-sawn relief plaque like the dove pictured above.

1 Select the material for your workpiece blank, then cut it to size. (We used ¾" Honduras mahogany for the oval dove plaque.)

2 Attach your pattern to the workpiece with artist's spray-mount adhesive. Then, drill a blade-threading hole or holes in an inconspicuous part of the pattern, such as an inside corner. (The dove plaque requires a separate threading hole for each of the six cutouts.)

3 Thread the blade into the workpiece, then cut each pattern piece. Next, cut the background to the desired shape. (We cut the oval plaque slightly oversize, then sanded it to finish size with a disk sander, as shown at *right*.)

4 Sand a slight round-over on the top edges of the pattern pieces and the inside edge of the background. Then, sand all the parts smooth.

5 Place the background *upside down* on a piece of waxed paper, and prop it up with ¼" spacer blocks, as shown in the photo *far right*. Insert the cut-out parts into the background, then run a bead of woodworker's glue around each piece.

6 After the glue dries, attach a saw-toothed hanger to the back of the plaque, then apply a clear finish.

Note: *On our dove plaque, the dove projects from the background. If you want your pattern recessed into the background, prop up the cut-out parts, instead.*

4 HOW TO MAKE GLOVE-TIGHT INLAYS

Use this bevel-cutting technique to make solid-wood inlays for boxtops, wall plaques, and other projects. To do it, your scroll saw must have a tilting table. (We used ⅛" walnut and maple for the unicorn inlay. We then glued the inlaid piece to the top of an unfinished walnut box purchased at a local craft supply store.)

1 Choose two contrasting woods of the same thickness for the inlay and background pieces. Cut the pieces large enough for your pattern plus at least 3" at one end for making test cuts when you set the tilt angle of the saw table.

2 Start with the saw table set at an angle between 8° and 12° (see note *below*). Tape the workpieces together with double-faced tape, then cut out a "test plug" in the margin area (see photo at *right*).

Note: *If you've tilted your table to the left, as we did in the photo,* top right, *rotate the stock counterclockwise into the blade to cut out the test plugs and pattern. If you've tilted your table to the right, rotate the stock clockwise into the blade. If you cut in the wrong direction, you'll get the reverse—the cut-out portion of the bottom piece will fit neatly into the top piece!*

Now, push the plug from the inlay (top) piece into the hole cut out of the background piece. If the plug doesn't fit snugly into the hole, reset the table angle and try again. (Notice in the photo that the middle plug dropped too far into the background piece. To compensate for this, we increased the table angle a few degrees to get the tight fit shown at *right*.) You may have to repeat this process several times before you get a tight, flush fit. Once you do, save the last plug you cut to serve as a guide block for drilling your blade-threading hole.

3 Attach your pattern to the workpiece with spray-mount adhesive. Then, use the last plug you cut in Step 2 as a guide block to drill your blade-threading hole at the correct angle, as shown in the photo *lower right*.

4 Thread the blade through the hole and cut out the pattern.

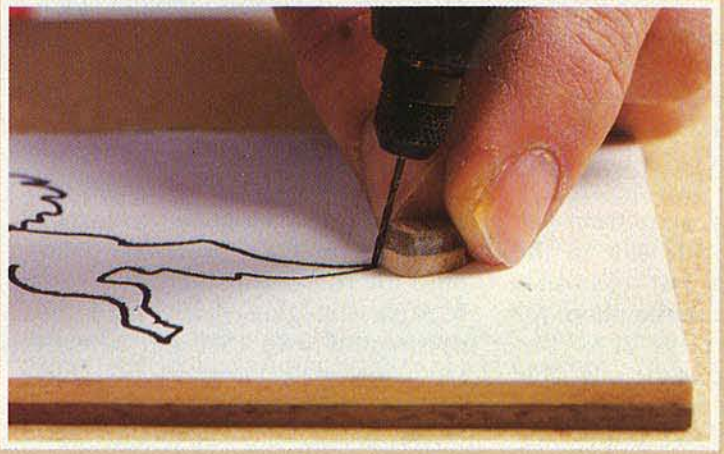
Note: *When cutting out patterns on a tilted table, gravity sometimes works against you. We found that the blade tends to drift toward the uphill side of the line when turning outside corners, as shown in the photo* far right. *You can compensate by slowing down the feed rate when making outside turns and applying slight pressure against the downhill side of the blade.*

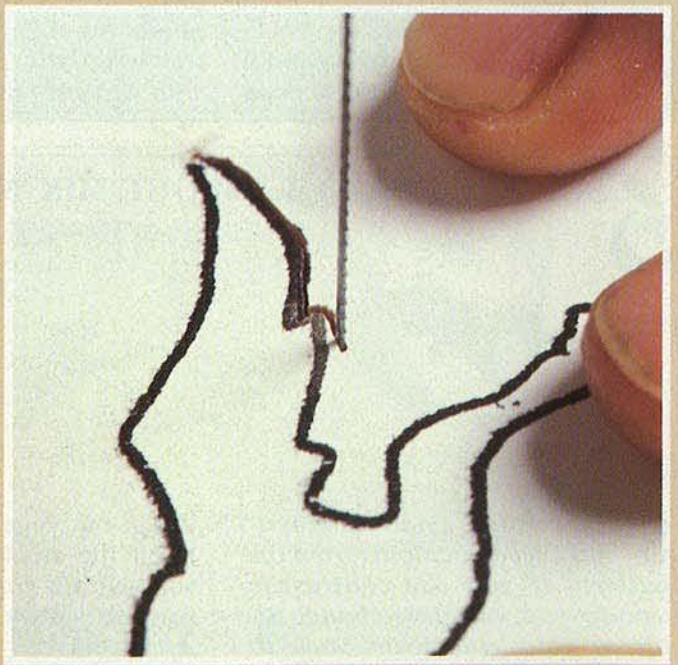
5 Apply a thin coat of woodworker's glue around the edges of the inlay. Press-fit it into the background. Wipe off glue squeeze-out.

6 After the glue has dried, fill any imperfections with colored wood putty or glue mixed with sanding dust. Then, use a sanding block with 220-grit sandpaper to sand the entire surface. Now, incorporate the inlaid piece into your project.

Cut out the oval on the scroll saw, staying slightly outside the line. Then, remove the waste with a disk sander.

Glue the cut-out pieces to the frame from the back side. Use cotton swabs to spread the glue evenly.





Upper left. To determine the exact table angle for making inlays, make test cuts in the waste portion of your workpiece. The plug from the top piece should fit snugly into the piece underneath as it does in the test cut at right.

Lower left. Use the last test plug you made as a guide to drill the blade-threading hole at the correct angle.

Above. When cutting outside curves, the blade may drift outside the line. To compensate, slow the feed rate and apply pressure against the downhill side of the blade.

Continued

5 WOOD SCULPTING MADE EASY

Here's a good way for you non-carvers to make a classy wood "sculpture" with your scroll saw and sanding machine.

1 Select a segmented pattern and cut it into its various components. Then, choose the type and thickness of wood you want for each pattern component and the background. (We made our sailboat sculpture from varying thicknesses of maple, walnut, and Honduras mahogany against a background of ¼" oak.)

2 Mount the pattern parts on the workpieces with spray-mount adhesive, as shown in the photo at *right*. If the pattern includes long, narrow pieces, lay them out parallel to the wood grain. Also, keep grain direction in mind while attaching the other pattern pieces for the most attractive looking parts. Cut out the parts on your scroll saw.

3 Sand the face side of each workpiece to the desired shape. (In the photo *far right*, we're shaping the boat hull on a stationary belt sander.) Sand only the area of each piece that will project *above* the background surface. Smooth the parts with 220-grit sandpaper.

4 On a piece of waxed paper, glue the parts together with quick-set epoxy. (Use small brads to hold the pieces in position, as shown in the photo on the next page.) Then, touch up the finished assembly with 220-grit sandpaper.

5 Cut the background piece to size, position the assembled sculpture on the face side, and trace the sculpture outline onto it.

6 Drill a blade-threading hole into the background piece, install the blade, and saw the cutout for the sculpture. Now, remove the background piece from the saw and smooth it with 220-grit sandpaper.

7 Insert the sculpture into the face side of the background, using a few pieces of masking tape to hold it in place, if necessary. Now, turn the workpiece face-down and spread quick-set epoxy into the joints between the sculpture and background. Before the epoxy sets, flip the piece back over and lay it, glued side down, on waxed paper.

8 After the glue dries, remove the waxed paper and sand the back smooth (we used a belt sander). Touch up any rough spots on the face side of the sculpture with 220-grit sandpaper. Apply a clear finish of your choice to both sides of the finished sculpture.

6 STACK 'EM UP, CUT 'EM OUT, MIX 'N' MATCH

Stack cutting enables you to make several cutouts from one pattern. If you use contrasting woods, you can interchange the pieces, and glue them back together so no two cutouts will be alike. Use ⅛" stock for small items, ¼" stock for larger ones.

1 From each type of wood you want to use, cut a piece slightly larger than your pattern (We used ⅛" walnut, maple, and Honduras mahogany for the rocking horses shown *above*.) Stick the pieces together, using double-faced tape.

2 Cut out your pattern and mount it on the stock with spray-mount adhesive. (If you want to reuse the pattern, make several photocopies.)

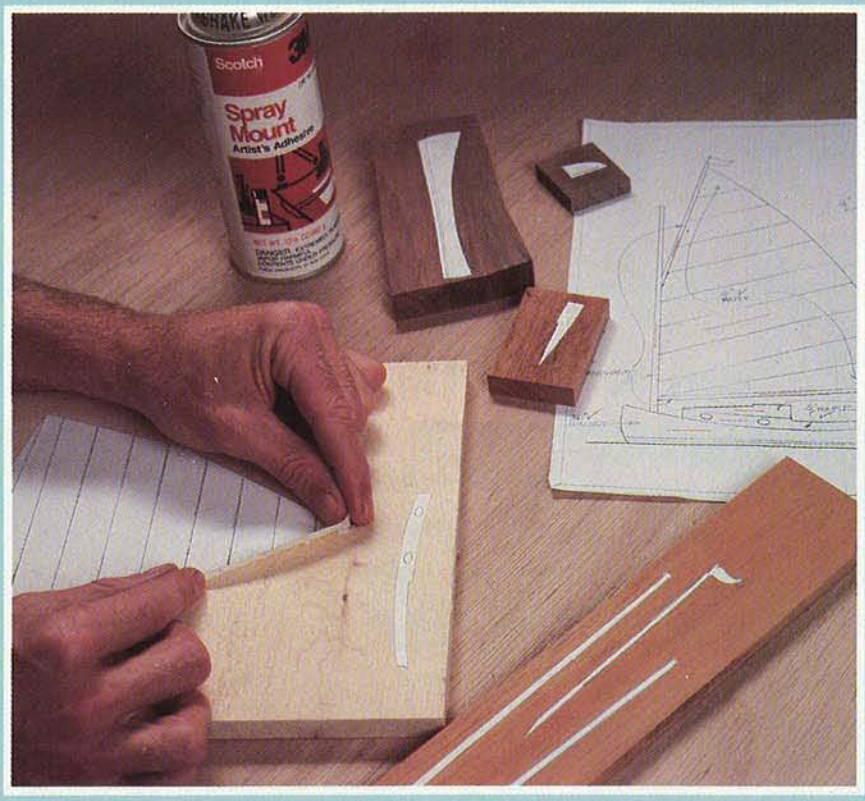
3 Cut out the pieces as shown in the photo at *right*.

Note: To keep tiny parts from falling through the blade slot in the saw table, make a *zero-clearance table top*, as shown in the photo *far upper right*. Cut a piece of ¼" plywood the same size as the saw table and clamp it to the table. Then drill a small hole for the blade and thread it through the plywood top.

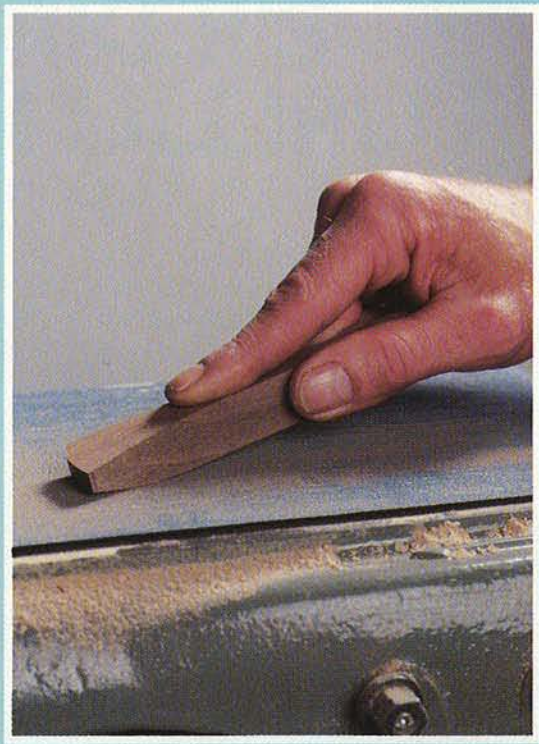
4 Separate the stacked parts and remove the tape. Then, arrange the parts on a piece of waxed paper and interchange the parts to make figures of interesting, contrasting colors as we did with the three rocking horse examples at *left*. If you have trouble separating the small pieces, dip them in a pan of lacquer thinner, then gently pry them apart.

5 Edge glue the pieces together with quick-set epoxy, using ½" brads to hold them in position, as shown in the photo *lower right*. (With our horses, we first glued the tiny head pieces together to form a larger piece, then glued this piece onto the rest of the figure.)

6 After the glue dries, sand the decorations with 150- and 220-grit sandpaper to remove excess glue. Apply a clear finish. For tree ornaments, drill a 1/16" hole in each one, then insert a string or wire.

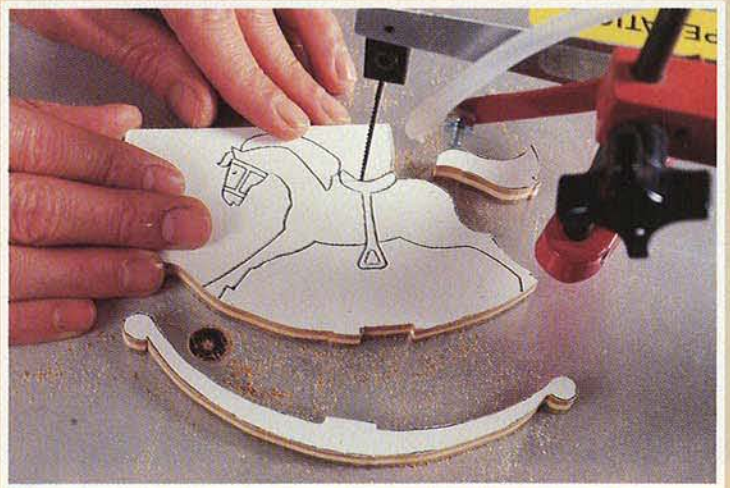


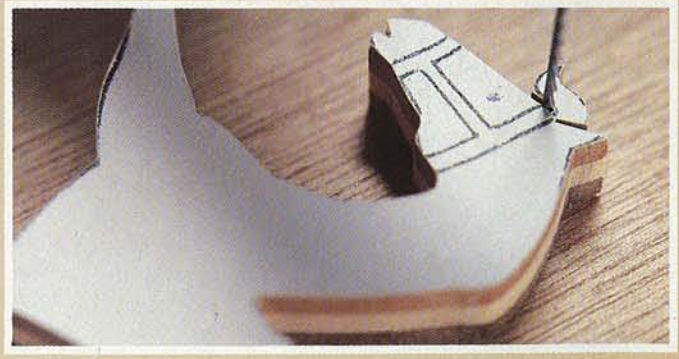
Mount the pattern pieces on stock of different thicknesses and kinds of wood, then cut out the individual parts on your scroll saw.

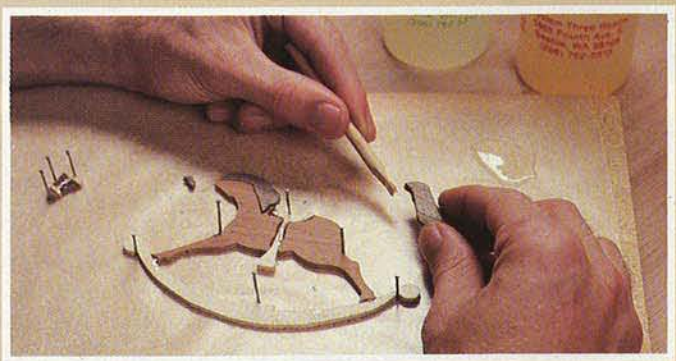


We found our stationary belt sander an excellent tool for quickly sculpting larger parts. You also can shape the parts on a disk sander or drum sander. Shape smaller parts by hand sanding.

Produced by James R. Downing and Jim Barrett
Photographs: Jim Kascoutas and Bob Calmer







Above. Double-faced tape holds the stacked pieces together while you cut out the ornament parts.

Upper right. Attach an auxiliary top of ¼" plywood to the scroll saw table, and drill a small hole for the blade. This keeps tiny pieces from falling through the blade slot in the table.

Right. Lay the parts on a piece of waxed paper, and glue them together with a quick-set epoxy. Use small brads to help hold the pieces together until the glue dries.

"Six hundred beds of the common measure were brought in carriages, and worked up in my house. A hundred and fifty of their beds, sewn together, made up the breadth and length; and these were four double, which, however, kept me very indifferently from the hardness of the floor, that was of smooth stone."

—*Jonathan Swift, Gulliver's Travels*

Noral Olson once turned out designs for mass-produced, commercial furniture. It was sleek, slick, and functional. Today, he designs and builds a custom-made line. It's elegant, ornate, and hardly practical. There's another difference, too. Noral could warehouse a month's production in a file drawer!

Miniature furniture collectors rate Noral's tiny pieces top-notch. His eye for design, perfect detail, and flair for finishing, set his scale furniture apart. For example, the 4"-high desk he holds, *above,* has a rolltop that rolls! We marveled at his work, and wanted to see just how he does it. So, in Seattle, we visited Noral and his wife, Inez, and shared a woodworking adventure in a modern-day Lilliput.

TEENSY-WEENSY FURNITURE: A WOODWORKER'S ADVENTURES IN LILLIPUT

Print this article

Seattle craftsman Noral Olson thrives on detail in 1:12 scale

It was two centuries ago that Jonathan Swift wrote of Gulliver's adventures in Lilliput. Swift created a fictional kingdom where soldiers stood tall at six inches. Gulliver felt uncomfortable there. Noral Olson would feel at home.

From a desktop in a house hugged by Seattle's lush greenery, he designs and builds furniture fit for Lilliputian royalty. In a scale of 1:12 (1″ = 1′), Noral crafts classic chairs, chests, clocks, desks, rockers, sofas, and tables.

Don't confuse Noral's work with ordinary dollhouse furniture, however. "The pieces I make are mostly keepsakes," he says, flicking a finger to tidy up a spot on his well-used but immaculate drawing board "workbench." Whatever you call them — keepsakes or collectibles — since 1970 he has crafted over 500 finely detailed pieces of thumbnail furniture, at prices paralleling the tags on full-size furnishings.

DETAILS AND MORE, BY DESIGN

Noral enjoyed the years he worked in the furniture industry as a designer. His eyes really dance, though, when he talks about his second career, as a miniaturist: "My philosophy has always been to design and make what people will buy. People want miniature furniture with lots of details, so I give them what they want."

And, oh, so many details! On Noral's furniture, the drawers, doors, and tops open. You'll find real glass in a breakfront or clock case (with a works that actually keeps time). Hand carving decorates chair and table legs, as well as Louis XV sofas. Tops have chamfered edges. Drawer pulls move, and even knobs are screwed on. Sometimes, he uses gold-plated hardware! If a piece of furniture someone wants duplicated in miniature lacks detail, Noral probably won't do it. "I like lots of doors and drawers. I know other craftsmen don't want to do them."

Noral made his first piece of miniature furniture for fun — a gift for his daughter. Now all his work is custom-order. "Someone will send me a photograph of a piece they want built, or a picture from a magazine. Very few send dimensions, but I can scale it by starting with the full size of the piece as I know it should be. Once I've calculated the dimensions, I draw a set of plans and build it."

The 2½″-high Italian bombé chest, *below,* was the sort of challenge Noral enjoys. It has 350 solid cherry parts (built-up for the contoured drawer fronts and case sides) and took him 65 hours to complete. The first chest earned him six commissions for duplicates.

"When I make a commissioned piece, the original customer retains the exclusive right to that piece. That means I will only make more pieces of that design for the person who first ordered it. If, for instance, you want a Biedermeier desk, you'll have to place your order for it with the original customer," explains Noral. This practice has worked well for him, and it protects each piece's exclusivity.

Noral's Italian bombé chest, made from selected cherry, took about 65 hours to complete. The price: about $600.

WOOD: THE FINER THE GRAIN, THE BETTER

For the most true-to-scale miniature furniture, wood has to be extremely fine- and close-grained. Oak, for instance, won't work for 1:12 scale furniture because its open grain shows up as gaping holes. "I do most of my pieces in basswood because I find it has the best grain."

While Noral prefers basswood, he also uses cherry, maple, and some walnut. Even in those fine-grained woods, not all pieces measure up to his high standards. Most miniature shops from Los Angeles to Seattle have seen his neatly groomed figure at one time or another fastidiously sorting through their pile of scale lumber for the very tightest grained pieces in 1/32″ to ¼″ thicknesses.

TINY TOOLS FOR TINY TREASURES

Noral spends his shop time dressed in a crisply pressed shirt and slacks. His personal neatness underlines a finely honed sense of order — perhaps a prerequisite for crafting highly detailed miniatures.

Noral's workshop occupies the space of a typewriter atop the desk in his Spartan home office. Opening a desk drawer, he displays his shop tools. "This is my table saw," Noral chuckles as he skillfully draws his X-acto knife the length of a 1/32″-thick piece of cherry. His fence is a metal ruler; his ripping blade a No. 11 X-acto tip.

At his fingertips, he lays down a selection of X-actos and other

Continued

knives of similar type. Noral spreads his tiny hand tools across the desk top: an assortment of dental picks, needle-nosed pliers, jeweler's files, a finger-powered twist drill and minuscule bits (dentist's drills), lathe tools no larger than Popsicle sticks, a fret saw, a pair of calipers, and a homemade miter box he's especially proud of. "X-acto makes one, but I can do finer work with mine," Noral says.

With a skew chisel you might mistake for a toothpick, or one of his jeweler's files, Noral turns out table and chair legs on his Dremel lathe. Its bed measures a wee bit longer than a new lead pencil.

"Turning is the only time I use magnification," he notes, mounting square stock for between centers work. "I use a 'Yankee' chuck. It has a selection of square 'tubes' you pull in or out to mount different size stock. I can go from ¼" square down to 1/16"."

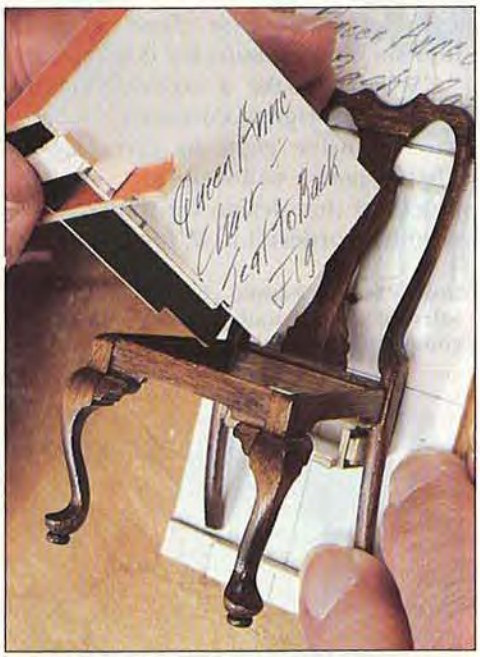
Noral's drill press stands no higher than a tall drink of water. It doubles as a router table. To make lips and fancy edges on furniture tops, he mounts a Dremel Moto-Tool fitted with a No. 193 cutter bit in the drill press. Then, he manuevers the workpiece around the bit. Noral tidies up the bits of debris with a hand-held Dust Buster.

JIGS FROM THE MEDICINE CHEST

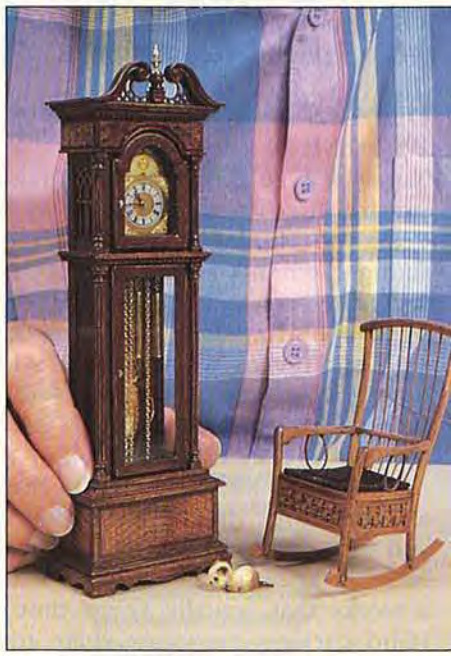
You won't find jigs for making teeny dovetails in Noral's shop (that's not

For turning a table leg, Noral employs magnification. He uses a jeweler's file to shape the ⅛" basswood stock held by the adjustable "Yankee" chuck.

A shoebox holds all the tools you need for building miniature furniture. Jeweler's files double as lathe tools. An X-acto knife becomes your table saw. Other tools Noral has collected from various sources fill the bill for tiny tasks.



To hold the Queen Anne chair in the correct position for gluing its curved frame, Noral made a jig from illustration board.



In 1:12 scale, this grandfather clock stands only 7" tall, but has full-size detail. The rocker features a worn leather seat.

his forte). You will find an occasional vitamin bottle, though.

"To bend the wood for the Beidermeier rolltop to exactly the right diameter, I searched for a vitamin bottle with the dimension I needed," Noral relates. "Then, I dipped the wood in hot water for about 15 minutes, put paper toweling on both sides, and bent it around the bottle. Rubber bands held it in place until it dried. It came out perfect!"

In full-scale shops, woodworkers utilize lots of plywood for making special-purpose jigs and fixtures. Noral doesn't manhandle heavy 4x8′ sheets through his shop. Instead, he builds occasional jigs from standard-size sheets of illustration board. One jig Noral uses holds the contoured shape of a Queen Anne chair frame in place for gluing, see photo, *left.*

Upholstered pieces require searching for small-patterned fabric. Fine silk covers the Louis XV sofa. Noral folds and glues seams, rather than sewing them.

FINISH FIRST FOR FINE FURNITURE

In miniature furniture, its the finish that unquestionably separates the so-so from the collectible, and there's no such thing as being too discriminating. Notes Noral: "Too much or too heavy a finish throws a piece out of scale, just like open-grain wood."

He avoids buildup and concealment of detail by finishing as much of a piece as he can *before* assembly. "That way, I avoid the glue smear problem, too," Noral notes.

First, he sands all the pieces with 220-grit garnet paper, wipes them off, and colors them with oil-base stain, which he intermixes to achieve the look of various different woods. "After the stain has completely dried, I use fine steel wool (No. 000) to reduce the wood fibers on round parts, and 600-grit paper for flat surfaces. It's really a smoothing and polishing technique," he explains.

Next comes the first of usually two, sometimes three, coats of a lacquer-based, semigloss, clear finish. "To avoid runs, I brush it on irregular surfaces and spray it on large, flat surfaces. But, I'm careful not to put any topcoat where I have to apply glue," Noral advises. Sanding between coats with fine steel wool and 600-grit paper also helps minimize buildup and removes any brushstrokes. And, frequent use of a tack cloth to remove all dust and sanding particles is a must.

"For a final coat on shaped parts, I use a hard paste wax," says Noral. "On flat surfaces, such as tabletops, I do a last polishing with pumice before I apply the wax."

To assemble, Noral doesn't put down a bead of glue on the pieces to be joined. Instead, he lays down a thin film of white glue on both surfaces to limit squeeze-out.

ADVICE FOR TRAVELS TO LILLIPUT

"You don't need a lot of equipment to make miniatures," says the master miniaturist. "I know some people that have basements full of equipment, but I simplify things. You need two wooden drawing boards — one for cutting and sanding, the other for finishing — some knives, small files, and a little drill. You can start out with kits. There are some nicely detailed ones that sell for $7 and up in miniature shops." In fact, Noral built a miniature pump organ for his daughter from a plastic kit. "By the time it was finished, you wouldn't know that it wasn't wood. You can embellish them, change the hardware, and add as much detail as you want to try," he offers.

Beginners quickly find out that making miniature furniture often requires some scrounging to make the scale parts fit. For the grandfather clock, for example, *left,* he hit a stone wall when it came to assembling the movement, hands, and face. The movement eventually came from a battery-operated wristwatch, while Noral found the moon dial face and serpentine hands in a miniature shop. The hardest problem developed in mounting the paper-thin hands to the movement. After considerable searching, Noral found a sympathetic jeweler to accepted the challenge and solve the dilemma.

Unlike the other pieces Noral makes, he's planning to keep the grandfather clock. Some things just take so much time they're too difficult to part with.

Produced by Peter J. Stephano
Photographs: Bob Hawks

You'll Reap One-Of-A-Kind Treasures When You

HARVEST YOUR OWN BOWL BLANKS

Print this article

To show just how to go about harvesting your own blanks, we did a lot of reading, interviewed three blank hunters, and then set out with a chain saw and camera to try out what we learned.

WHERE TO LOOK FOR NATURE'S BOUNTY

Before you set out prospecting, bear in mind that trees, even downed trees and stumps — which are what you're after — belong to someone. You'll be hunting on someone else's land, so introduce yourself and explain what you'd like to do.

Many timber owners will appreciate being offered a few dollars for a portion of a fallen tree, and some probably will let you remove it for free. Show specimens of your finished bowls, and an owner might even volunteer to be on the lookout for the odd stump, crotch, or burl that very well may hide some magic inside.

Check farms, wood lots, areas being cleared for new homes. You can find unburied treasure just about anywhere trees grow. Other possibilities include:

- **National Forest Service** offices issue permits for wood-gathering on federally administered lands. John Lea, one of our woodturner consultants for this article, reports that the Forest Service office charges $10 for a license to collect up to four cords of "dead and down" wood in his favorite hunting ground near Flagstaff, Arizona. Some state, county, and local parks do likewise.
- Many **firewood companies** will be happy to sell you logs for more than they'd go for as fuel, especially if you're willing to cut them up and haul them yourself.

Attention, turners:
Thar's bowls in them thar trees. Yes, an ordinary fallen log or stump can be a "bowl mine" for any turner willing to chain saw it into turning blanks. Invest a few pleasurable hours traipsing through the woods, and you can come home with enough handsomely figured blanks to feed your lathe all winter, almost for free. What's more, you gain the satisfaction of following a project from nature to the beautifully finished end result.

- **Nurseries and tree surgeons** might know about prize specimens practically in your own backyard. If they can charge a homeowner to remove a dead tree, sell you select pieces at a premium, and get rid of the rest as firewood, they gain three ways instead of two.
- **Contractors** clearing trees threatening power lines leave a bounty of downed wood in their path. Again, ask permission; these trees usually remain the property of the landowner.

Maple, elm, walnut, cherry, butternut, apple — just about any species of hardwood can yield a beautiful bowl, but the harder and more exotic, the better. With bowl blanks, figure and grain are the names of the game. So keep an eye out for the parts of trees in which these are most interesting, namely stumps, crotches, and nodes where branches tried to grow and failed.

Once you've found a likely candidate, slice off an inch or so in order to get a good look at the wood. Note especially where the pith (center of growth) is located. You want to avoid the unstable pith (which will almost certainly crack) and the area immediately around it when you lay out the cuts for your blanks.

SEALING THE BLANKS — THE KEY TO MOISTURE LOSS

The slabs you've just cut out will probably be heavy (and they'll seem even heavier if you have to lug them very far). Moisture accounts for most of the weight in newly cut wood. You need to retard the rate at which that moisture evaporates. If wood dries out too quickly, it tends to check and split, making it useless for turning.

Blocks can begin to crack within hours, so we seal end-grain cuts by immediately coating them with Sealtite (see the Buying Guide on page 49 for ordering information). Other turners use paraffin, shellac, varnish, floor wax, even old latex or oil paint to seal their blanks. We liberally slosh on Sealtite with a brush. Seal only the end grain; if you seal the whole blank, the piece will take too long to season.

TURN NO BLANK BEFORE ITS TIME

Store the freshly cut blanks in an area that's unheated but protected from rain and direct sunlight — in the garage, for example, or under plastic on the north side of a building. As a precaution, if you see any bugs on the wood, spray or dust it with an insecticide. Stand the blocks on their sealed ends, with about an inch of air space around each one. This allows the blanks' surfaces to dry and minimizes fungus growth.

After marking the bowl profiles on the end of the spalted-maple log section with a felt-tipped marker, we slabbed the bowl blanks to size with a chain saw.

Check your stockpile every few days. You'll notice the blanks getting lighter and lighter as they lose water and seek moisture equilibrium with the air around them. Some turners use food or baby scales to weigh their blanks to the nearest ounce; others gauge a blank's weight by simply hefting it. Eventually, you'll notice that a block has stopped losing weight. This means that its moisture content has come into harmony with the air around it. Once the blank has remained the same weight for several weeks, you can then move the block inside to dryer, heated air.

Indoors, choose a location that's warm but not extremely dry, well away from the furnace or woodstove. In a few days you'll notice the wood again losing weight as it releases more moisture to its drier environment. The losses are more subtle now, and a scale really comes in handy to check for weight loss. When its weight remains unchanged for about three weeks, consider the blank adequately seasoned and ready for turning.

ONE GOOD WAY TO HURRY NATURE ALONG

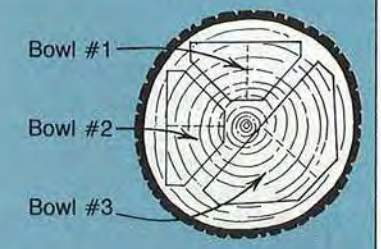
Thick blocks of wood can take a year or more to dry thoroughly. Don't worry though, you can speed up the process. One method is to turn the unseasoned blanks into bowls with 1"-thick walls. Then, coat them completely with any of the sealants mentioned earlier.

Store these bowls first in an unheated space, and monitor their weight loss. After they stop losing weight, bring them inside and continue weighing them once a week until they again stop losing weight.

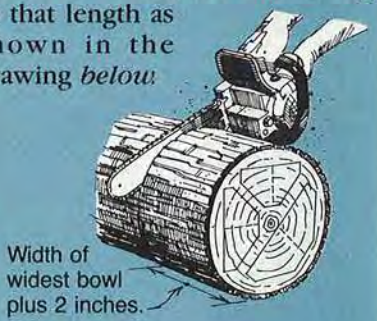
Text continues on page 47

HOW TO LAY OUT AND CUT BLANKS

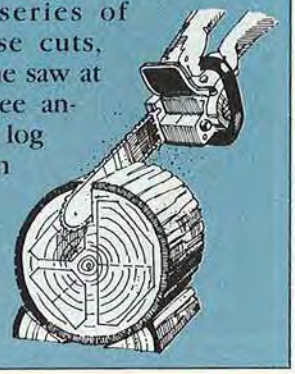
To maximize bowl blank size, use a crayon, chalk, or marker, and draw profiles on the log's end for the blanks you'll be cutting.



Try to capture the most intriguing grain patterns (see our step-by-step photos on the next page for details). Once you've laid out the blanks, measure the widest one, add a couple of inches for waste, and cut the log to that length as shown in the drawing *below.*



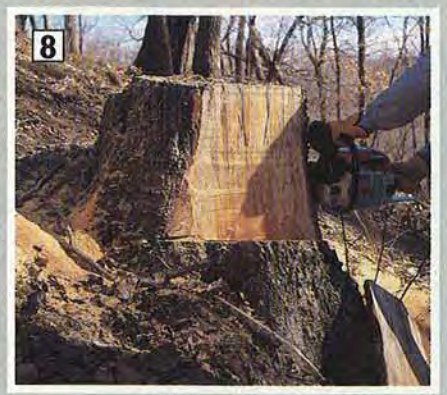
Roll the sawn section away from the main log, and examine the grain exposed by your second cut. If new defects show up, you may want to revise your layout. Finally, brace the log so it won't roll, and make a series of lengthwise cuts, holding the saw at a 30-degree angle to the log as shown at *right.*

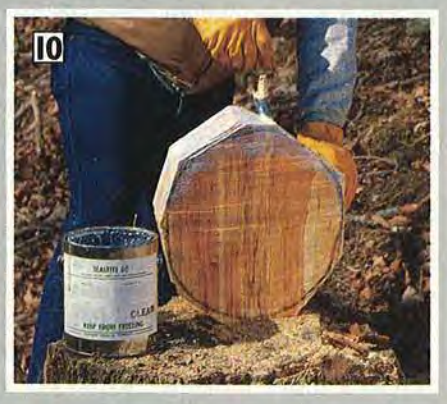


BOWL BLANKS

WOOD TAKES TO THE WOODS

One sunny day early last spring, Marlen Kemmet and Lee Gatzke, two of the harder-core bowl turners on our staff, decided to duck out of the office and do some field work for this article. They wanted to follow up on a HOT tip they'd received from a sawyer in north-central Iowa. It seems that they were on the trail of some fantastic-looking spalted maple (see the discussion on spalting, far *right*). Here's what they found, and how they went about harvesting their newfound treasure.





1 Luck was with us! That maple log was exactly where we'd been told it was. Our source said the remaining section was originally near the top of the tree, probably about 30 feet from the ground. The lower part of the trunk had already been hauled off to a saw mill.

Lying in a pasture near the edge of a wooded area, the maple log had been exposed to the elements for over three years.

2 Using a chain saw, we sliced an inch off the end of the log, and here's what we discovered — a handsomely spalted pattern. At that moment we both experienced what early miners probably felt when they struck gold.

Note the pith (see the arrow) located to the left of center. Its position will determine how we lay out the bowl profiles.

3 After examining the log, we decided that the end section could yield three good-sized bowl blanks. Drawing the profile of several bowls provides a good indication of the largest size bowl we'll be able to turn from each blank later. Note, when drawing each bowl's profile we avoided the pith, just above Lee's right hand.

4 Normally we cut the length of the log to the diameter of the largest bowl, plus a couple of inches. Because of previously cut branches, we found it easier to cut a section *twice* the diameter of the largest bowl, plus three inches, and trim the blanks in half later. Also, notice how we propped the log up with a limb to prevent sawing into the ground and dulling the blade.

5 For our first cut along the length, we had to make one pass, roll the log over, and make another. Brace the log well, and hold the saw at a 30-degree angle to the cut for ease in cutting and better control.

5A For the second cut we set the log section on end. Our 16-inch chain saw handled this lengthwise cut in a single pass. Finally, we cut each length in half to obtain two good-sized bowl blanks from each section.

6 Next, we turned our attention to the mushroom-topped stump of that same maple tree. Stump wood often makes the best blanks of all. In this case, the exposed top let in lots of moisture — one of the key ingredients for spalting.

7 Sure enough, a thin, vertical test cut exposed this spalted veining. A bowl turner's bonanza!

8 With a series of vertical cuts we sliced the stump into several slabs. Again, we took care to cut around the pith and avoided dulling the saw blade in the dirt.

9 The stump made a handy bench for holding the slabs as we marked and trimmed them into bowl blanks. The size and shape of the slabs helped determine the size and quantity of blanks we could get from each slab. We figured we could get one large blank and two smaller ones from the original slab. The bigger the blanks you can cut, the more options you'll have when it comes time to mount them on your lathe.

10 To slow down the drying process, we coated the end grain of each blank in the field with sealer. On hot days, we've experienced bowl blanks beginning to check within hours after cutting if left uncoated. You don't need to coat edge or surface (face) grain or surfaces that are still covered by bark. The moisture leaves these surfaces at a slow enough pace. Coating more than the end grain can cause the blank to dry too slow, and it can be years before the blank is dry enough to turn without cracking.

The time it takes for a rough-turned bowl to dry varies widely — from six weeks to six months or more — depending on its initial moisture content, the temperature, humidity, the bowl's thickness, and the thickness of the sealant.

You can expect weight losses from a few ounces up to more than half the piece's initial weight. After a rough-turned bowl has stopped losing weight for at least three weeks, you can remount it, finish turning, and apply the finish.

Recently, some turners have been experimenting with drying rough-cut bowls in a microwave oven, a process that offers lots of promise for anyone in a rush to transform a piece of wood from one life to another. We'll be delving into microwave wood drying in a future issue.

SPALTING — MOTHER NATURE'S CALLIGRAPHY

After a tree dies it goes through a long, slow process of decomposition. This often enhances the wood's beauty in much the same way that a few wrinkles or gray hairs bring character to a person's appearance. Part of the decaying process, known as spalting, spices up bland woods and brings a gleam to a bowl turner's eyes.

Spalting works like this: Under the right conditions, as a log begins to decay, fungi enters the log and begins to decompose the wood. Gradually the spreading fungi create black or dark brown markings. Some spalting looks as delicate as Chinese calligraphy. Other patterns appear like broad strokes from an avant-garde painter's brush. Like snowflakes, no two spalted designs are ever the same, even six inches down the same tree.

You'll usually find spalting occurring in downed trees, exposed to plenty of moisture and in areas with rich soil. Woods most likely to spalt include birch, beech, elm, gum, most fruitwood species, and (especially) maple. Mushrooms growing on a maple stump signal that spalting *may be* taking place.

Continued

BOWL BANKS

JOHN LEA: HUNTING ALLIGATORS IN ARIZONA

When John Lea, a professor at Arizona State University and an avid turner, sets out to prospect for burls, he and Phil Brennion, a wood sculptor friend, prepare for an expedition. Into a four-wheel-drive truck go a couple of chain saws, a two-man handsaw, pry bars, a shovel for when they get stuck, towing cables, gloves, a tape measure, ear protectors, safety glasses, a first-aid kit, plus food, water, and camping gear for a couple of nights out in the open.

Their quarry? John and Phil hunt pine, oak, juniper, aspen, citrus, walnut, manzanita, mesquite, and other exotic species. But they look especially hard for alligator juniper *(Juniperus deppeana),* a soft, lightweight, light red wood typically used for fuel and fenceposts because of its resistance to decay. The common name comes from the thick and rough, gray or blackish bark that looks a lot like the back of an alligator.

Arizona alligators grow at elevations between 4,500 and 8,000 feet. These areas often fall under the jurisdiction of the National Forest Service or the Bureau of Land Management. The Forest Service manages 12 million acres in Arizona, divided into six national forests. Before heading for the boondocks, they check in with a Forest Service office, get a wood-gathering permit, collect maps, and determine where wood gathering operations have taken place. With this information and a general knowledge of the mountains, they can block out an area to search.

"We have our best success driving along old back roads with binoculars at hand," John says. "These let us check out a likely looking stump without wasting a lot of time climbing up and down hills and washes only to discover that what looked like a perfect burl turns out to be a less than perfect boulder."

MARY REDIG: SCAVENGING DEADWOOD IN MINNESOTA

Mary Redig enjoys finding wood to turn *almost* as much as she loves turning it into delicate, thin-walled plates and vases. She sifts through friends' firewood, checks neighbors' fresh-cut and dead trees, and hangs out at sawmills. But she often finds some of the best pieces on jaunts through the woods just down the road from her house in Shoreview, Minnesota.

"Even my children get in on the act," she says. "If we're out on a bike ride and they notice a piece of wood, they point it out to me. Lots of times I come home balancing a hollowed-out log in my bike's basket."

Mary doesn't cut blanks in the field. Instead she saws off logs twice as long as they are thick, brings them home, and cuts them into slabs on her band saw or uses her chain saw on larger pieces.

Burls stay in the shop because, she's discovered, they season fine there. Logs go outside, first to a damp area on the north side of the house, then after a few months to a drier spot. Mary lays the logs on sheets of tin and covers them with plastic to retard the drying. She also seals the end cuts, either by rubbing on wax in the field or by dipping them in melted paraffin later.

PETER SIELING: MINING A WOODLOT IN UPSTATE NEW YORK

For hardwood lumber dealer Peter Sieling, bowl blanks are a profitable part of his woodlot operation.

"Because I sell stock, I'll cut the entire trunk into blocks, but I pay the most attention to the stump and crotch areas," Peter says. "These generally have the most interesting figure and will make the prettiest and most valuable bowls. After cutting the blanks to rough size with a chain saw, which leaves a wide and uneven kerf, I finish cutting the individual blocks on a 36″ band saw. The result is a stack of rectangular rather than square blocks. The extra length is insurance. In spite of all precautions, the ends of blocks will sometimes crack. With the extra length, I can later saw off the crack without reducing the final bowl diameter," states Peter.

Like Mary Redig, Peter dips the cut ends of blocks in melted paraffin. "Paraffin will spontaneously ignite if it gets too hot and should be used with extreme caution," he warns. "You'll know it's too hot when a dipped block sizzles like frying bacon."

Peter often rough turns 1″-thick bowls from green bowl blanks. First, he band-saws the blank round, mounts it to the lathe, and turns it until the wall thickness is approximately 1″. Then, after removing it from the lathe, and unfastening the faceplate, he seals the entire bowl with paraffin, and air-dries the rough-turned bowl.

"Because wood shrinks unevenly as it dries, the bowl becomes elliptical," he's learned. "Later, after the bowl has dried, I remount it on the lathe, turn it round again, and apply the finish. While thick blocks can take several years to dry, I can speed up the process to a few months by rough-turning the bowls and drying them instead of drying the entire blank."

A sharp chain saw is a must for Peter Sieling when cutting bowl blanks in his woodlot.

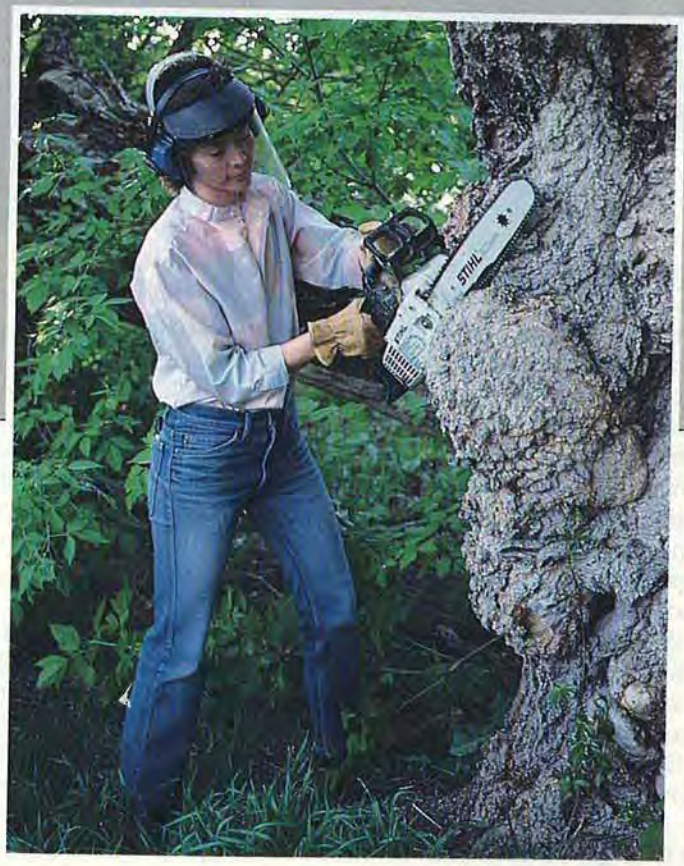
At home, John keeps some wood in his yard, covered with a tarpaulin and arranged to allow air circulation without exposure to the broiling Arizona sun. Drier pieces go into a residential garage with a west-facing metal door.

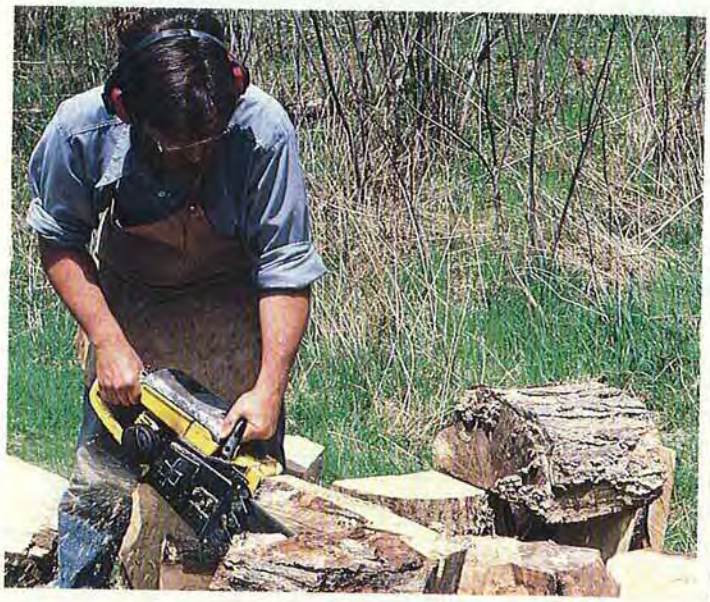
"On a summer afternoon," John observes, "this 'oven' reaches 130 degrees Fahrenheit and simmers the moisture out of the inventory. Our annual humidity averages 37 percent, but in the summer it may get down to three or four percent. Wood dries quickly here."

John Lea loves hunting and harvesting Arizona "alligators" in the high country near Flagstaff with his companion, and fellow turner, Phil Brennion.

"After cutting and before dipping, I use a marker to label the type of wood and the date harvested on the blank or log. Dipping the ends of the blanks seals the softer woods such as sumac and butternut," Mary notes. "But with hardwoods such as Minnesota's ironwood and lilac, I haven't found anything yet that works very well. I just let them crack where they will and salvage what's left."

In the field, Mary Redig, president of Minnesota Woodturners Association, checks first for the best cutting angle on a heavily burled dead tree.





BUYING GUIDE

- **Sealtite.** Green wood sealer, catalog no. 01W61, $14.50 per gallon ppd. Woodcraft, 41 Atlantic Ave., P.O. Box 4000, Woburn, MA 01888.

Produced by Marlen Kemmet with James A. Hufnagel
Photographs: Bob Calmer Illustrations: Jim Stevenson

KNOW YOUR WOODWORKING

ABRASIVES

If you think "abrasives" means sandpaper and steel wool, you've only scratched the surface.

With the large selection of products now available, you'll find it easier than ever to smooth your way to a fine finish.

Hot new sanding belts in cool blue: Zirconia alumina belts remove stock fast and outlast all the others.

Print this article

COATED ABRASIVES: SANDPAPER AND A WHOLE LOT MORE

Coated abrasives include products made up of abrasive minerals bonded to a backing material with a glue or resin bonding agent. Yes, they still come in the familiar sheets, disks, belts, and drums. But you'll also find them on other backings: cords, cloth strips, and sponge-backed blocks for sanding contoured surfaces and getting into tight places. Each form has its uses, as shown in the chart *on the facing page.* But no matter which form you choose, you also have to pick the right *abrasive minerals* and *grit sizes* to get the best results.

FIVE OPTIONS IN ABRASIVE MINERALS

When selecting abrasive coatings, you can choose from two natural minerals (flint and garnet) and three manufactured ones (aluminum oxide, silicon carbide, and zirconia alumina).

Flint: Inexpensive, but no bargain!

Flint, the original sandpaper mineral, has been practically obsoleted. It breaks down easily and dulls more quickly than the other abrasive minerals. If you can find flint, it will be in sheet paper only. Our advice: don't waste your money.

Garnet: A fast-cutting paper for hand sanding

Garnet remains the woodworker's favorite for most hand-sanding operations. This mineral fractures easily as you sand, producing extremely sharp edges—great for quickly removing material by hand. However, even the finest grit garnet papers don't leave quite as smooth a surface as aluminum oxide or silicon carbide papers. For this reason, when hand-sanding hard woods, we generally use garnet papers up to 150-grit, then finish-sand with 220-

Abrasive minerals by color: 1. silicon carbide, 2. aluminum oxide (coated with zinc stearate), 3. aluminum oxide (coarse) 4. aluminum oxide (fine), 5. garnet, 6. flint.

grit aluminum oxide or silicon carbide paper.

Also, garnet won't hold up to the pressure exerted by power sanding machines nearly as well as aluminum oxide or zirconia alumina.

Aluminum Oxide: An all-around performer

You'll find aluminum oxide available in more forms than any other abrasive mineral—sheets, disks, drums, sanding blocks, cords, and nonwoven finishing pads. The light- to dark-brown, wedge-shaped particles resist fracturing, but aren't as sharp as garnet. This durability makes aluminum oxide good for power sanding, because machine speed compensates for its slower cutting properties. Use the finer grits (220, 320) for final dry sanding before applying the finish.

Silicon Carbide: Use it for finish sanding, wet or dry

Silicon carbide particles have extremely hard, sharp edges that cut faster than aluminum oxide or garnet. We found that fine-grit silicon carbide sheets cut faster and last much longer than aluminum oxide. So, we prefer these for finish-sanding hardwoods by hand and, with a waterproof backing, for wet-sanding bare wood and finishes between coats (see page 53). But silicon carbide costs more than garnet or aluminum oxide, and it doesn't work quite as well as garnet for rough-sanding by hand. It also doesn't hold up as well as aluminum oxide for power sanding.

Zirconia Alumina: Good news for power sanding

If you haven't heard of this bright-blue mineral, you're not alone. Developed by Norton Abrasives, under the trade name *NorZon,* it's the newest, most expensive, and most specialized of the manufactured abrasive minerals.

For the home woodworker, zirconia alumina comes in belts in standard sizes and grits for portable and stationary belt sanders. You'll also find it in 9″ adhesive-backed disks for disk sanders, and in smaller sizes for drill sanding attachments.

Zirconia alumina products cost between 10% and 20% more than their equivalent in aluminum oxide. But its self-sharpening characteristics and ability to withstand heat and pressure make zirconia alumina the most durable, long-lasting abrasive mineral for power sanding. And, it cuts faster than any abrasive mineral. We recommend 100-grit belts for rough sanding with a portable or stationary belt sander. You won't get these advantages when hand sanding, so you won't find it in sheets. If you can't find a local supplier for NorZon products, contact Norton for dealers in your area. See buyer's guide on page 53.

GRIT SIZES: OUR RECOMMENDATIONS

Grit number (or mesh number) refers to the particle size of the mineral used for the abrasive. The numbers range from 36 grit on coarse abrasive belts to 600 grit on very fine silicon carbide papers. However, the sanding products you'll most often use fall within the 60- to 220-grit range.

When sanding bare wood prior to finishing, you don't need to work your way through the full range of available grit sizes, especially if you use a power sander for some of the work. For instance, to smooth a flat surface, we usually start with a portable or stationary belt sander equipped with an 80- or 100-grit aluminum-oxide belt. Then, we switch to a finishing sander, using 150-grit or 180-grit garnet paper, then 220-grit aluminum oxide paper. The chart at *left* lists the recommended abrasives and grit sizes for various sanding procedures.

Here's what we usually stock in the WOOD shop:

- Sheet paper: garnet, 60, 80, 100, 150 grit; aluminum oxide, 220, 320 grit.
- Belts for portable belt sander: aluminum oxide, 60, 80, 100, 150 grit.
- Belts for stationary belt sander: aluminum oxide, 80 or 100 grit.
- 9″ disks for stationary disk sander: 60, 100 grit.

The above abrasives handle most of our sanding chores, so we try to keep a good supply on hand. We buy more specialized abrasive products as we need them.

Continued

CHOOSING THE RIGHT ABRASIVE FOR THE JOB

Application	Tool/Product	Abrasive	Grit
Surfacing rough wood, fast stock removal	Surface sander, belt sander	Aluminum oxide, zirconia alumina	36-80
Rough-sanding mill marks, saw marks, defects, end grain	Orbital sander, belt sander, disk sander	Aluminum oxide, zirconia alumina, garnet	60-100
Smooth sanding	Orbital sander, disk sander, sheet sandpaper	Aluminum oxide, garnet, silicon carbide	120-320
	Sanding blocks, non-woven pads	aluminum oxide, silicon carbide	medium-fine
Sanding contours	Sanding drums, disks, flappers, cords, strips	Aluminum oxide, garnet, silicon carbide	80-320
	Sanding blocks, non-woven pads	aluminum oxide, silicon carbide	coarse-fine
Wet sanding, applying stains or oils, sanding between finish coats.	Sanding sheets non-woven pads	silicon carbide aluminum oxide	240-600 fine-extra fine
	steel wool		#00-#0000

ABRASIVES

OPEN-COAT VS. CLOSED-COAT PAPERS

Here's yet another decision to make. On closed-coat sandpapers, the abrasive mineral covers the entire surface. On open-coat papers, the mineral covers only 50-70% of the paper's surface, so they won't clog or fill up as quickly as closed-coat papers. We generally use open-coat paper on resinous softwoods and other woods that tend to "load up" or clog the paper; also for power sanding. Closed-coat paper cuts faster because it has more abrasive mineral on the surface, which makes it a better choice for most hand-sanding chores.

Manufacturers treat some of their silicon carbide and aluminum oxide papers with zinc stearate to keep them from loading up. The treatment also turns the paper off-white, as shown in the photo on page 50. We like to use these papers in the finer grits for finish sanding.

FLEXIBLE ABRASIVES FOR SANDING CONTOURS

The following specialized sanding products will help you smooth out the curves and get into those hard-to-reach spots. For sources, see our buyer's guide on page 53.

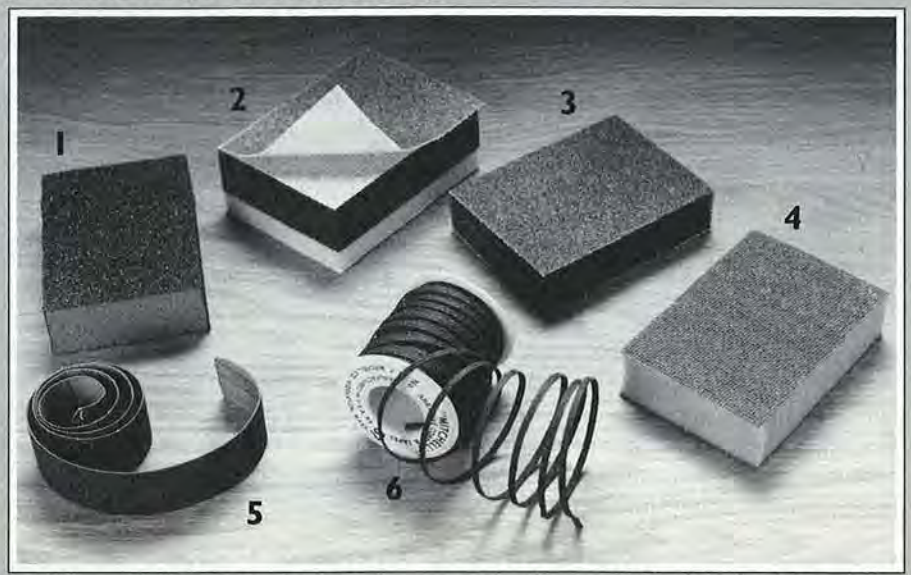
Foam sanding blocks have a backing of flexible sponge material with an aluminum-oxide abrasive coating on one, two, or four sides. The palm-size blocks measure about 3″ wide by 4″ long by ½″ to 2″ thick. As shown in the photo *at right*, the abrasive may be bonded directly to the pad (1), attached with a hook-and-pile fastener (2) or bonded to an intermediate fabric backing (3, 4). When the blocks clog up with sanding residue, just wash them in clean water and reuse.

We found that all of these blocks work well on flat and contoured surfaces, but are too flexible to use for a sharp edge or corner.

Cloth-backed sanding strips, or *shop rolls*, come in standard grit sizes from 40 to 240 grit. You can buy the 50-yard rolls in 1″, 1½″ and 2″ widths. They're great for hand-sanding contoured shapes, such as turned spindles. Keep a roll handy next to your lathe.

Abrasive cords get you into those tight spots that other sanding products won't reach. Made exclusively by the Mitchell Company, the aluminum oxide-coated cloth cords come in widths from 1/16″ to ¼″, and standard grits from 120 to 200.

In addition to these products, you'll find two nifty power tool attachments for contour sanding—flap sanders and inflatable sanding drums (see photo *at right*).



Sand "paper" alternatives include foam sanding blocks (1-4), cloth-backed sanding strips (5), and abrasive cords and tapes (6). Use these products for sanding contoured surfaces and getting into tight spots.

Flapper-type sanders fit portable drills. The one shown here is the Sand-O-Flex from Merit Abrasives.

Inflatable drum sanders fit portable drills, drill presses, and lathes. You inflate them with an air pump.

SPECIALTY ABRASIVES FOR A FINE FINISH

The sanding process on bare wood usually ends with 220-grit sandpaper. Then you apply the finish of your choice. But in some cases, you may need an even smoother surface prior to applying the finish. In such situations, you can wet-sand with fine-grit wet/dry sandpapers, or use steel wool or nonwoven finishing pads for final smoothing.

You also can use these products to smooth and level sealers and finishes between coats. We have found that the fine-grit finishing pads also work great for applying penetrating finishes, such as Danish oil or tung oil. (See photo *below.*)

Wet/dry sandpapers come in most of the standard grit sizes, though you'll usually use 220- to 600-grit papers for wet-sanding wood and finishes. These silicon carbide papers have a waterproof bonding agent and backing.

Steel wool comes in seven grades, ranging from #3 (coarsest) to #0000 (finest). Use the coarser grades for removing chemical paint strippers during refinishing. Use the finer grades (#00-#0000) for smoothing contoured surfaces prior to applying a finish, and between finish coats.

Steel wool has always elicited two major complaints from woodworkers—it rusts, and it sheds tiny strands of steel, which you must then remove with a tack cloth.

To prevent rust, most manufacturers put a light coat of oil on the steel wool pads. This oil may affect the adhesion or penetration of some stains and finishes. We suggest that you soak the pads in acetone or lacquer thinner to remove the oil before using them. High-quality steel wools have longer strands, so they won't shed quite as much as low-quality ones. Some are also oil-free. See buyer's guide at *right.*

Non-woven finishing pads have the best qualities of wet/dry sandpaper and steel wool. The ¼"-thick nylon fiber pads easily conform to contoured surfaces, won't shed, and can be cut into various shapes and sizes. Most come impregnated with silicon carbide or aluminum oxide powders in various grits, which are labeled *coarse* to *extra fine.*

We have found that these pads outlast steel wool and sandpaper.

Pumice and rottenstone have one purpose only—to rub out the topcoat of hard finishes, such as lacquer, varnish, and shellac. (Don't use them on oil finishes). You mix these powdered abrasives with an oil lubricant, such as paraffin oil or lemon oil, and apply them with a felt pad. Pumice comes in coarse and fine grades. You start with the coarse grade, then go to the fine grade. If you want an even higher polish, follow up with rottenstone mixed with a lubricant.

Above: **For a hand-rubbed finish, use lemon oil or paraffin oil and a felt cloth to rub out finishes with pumice and rottenstone.**

Right: **Non-woven finishing pads work great for smoothing wood while applying oil finishes; also for leveling hard finishes between coats.**

Produced by Jim Barrett with David Donnelly

Photographs: Bob Calmer and Jim Kascoutas

WHERE TO BUY ABRASIVES

You can buy these products in hardware stores, home improvement centers, and woodworking supply catalogs. For more information, call or write to these sources:

Zirconia alumina belts and disks

- Norton Company, Abrasives Marketing Group, Worcester, MA 01606-2698, 1-800/524-2110

Abrasive cords and tapes

- E.C. Mitchell Co., P.O. Box 607, Middleton, MA 01949-0907, 617/774-1191

Inflatable sanding drums

- Fine Tool Shops, 170 West Road, P.O. Box 7091, Portsmouth, NH 03801,1-800/533-5305
- Industrial Abrasives Company, 642 N. Eighth St., Reading, PA 19603, 1-800/428-2222
- Trimex Industrial, Dept W, Route 11, Mooers, NY 12958, 518/236-5521

Cloth-backed sanding strips

- Jet Equipment & Tool, 1901 Jefferson Ave., Tacoma, WA 98402, 1-800/426-7941
- Norton Company (see above)

Flapper sanding attachments

- Merit Abrasive Products, 201 Manville, Compton, CA 90224, In Calif.: 213/774-6650, Outside Calif.: 1-800/421-1936

Non-woven finishing pads

- 3M Home Products Division, 3M Center, Bldg. 223-4S, St. Paul, MN 55144, Att'n: Tom Nelson
- Glit, Inc. 809 Broad St., Wrens, GA 30833-0709, 1-800/431-2976
- Norton Company (see above)

Premium steel wool

- Liberon, P.O. Box 1750 Dept. W., Mendocino, CA 95460, 707/937-0375
- Garrett Wade, 161 Avenue of the Americas, Dept. W, New York, NY 10013, 1-800/221-2942

ONE GREAT-LOOKING MANTEL CLOCK

NO MATTER HOW YOU LOOK AT IT

Print this article

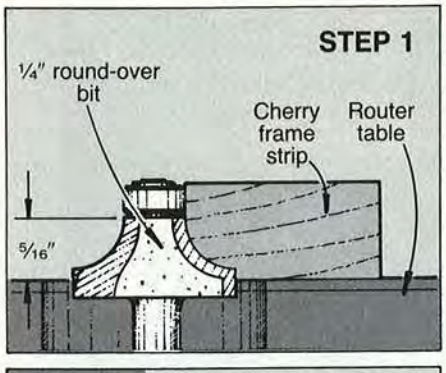
The decision to build comes easy. But, deciding where you'll display it may be a pleasant dilemma. Right at home on a mantel or handsomely hung on a wall, our cherry-cased clock fits well into almost any decor and adds a bit of class to any room.

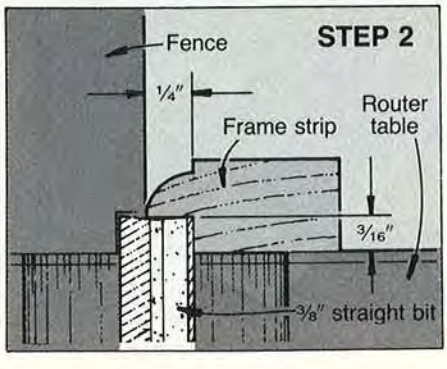
MAKING THE FRONT AND SIDE FRAMES

Note: *You'll need some ½" stock for this project. You can resaw or plane thicker stock to the correct thickness or special-order it. See the Buying Guide on page 57 for our source.*

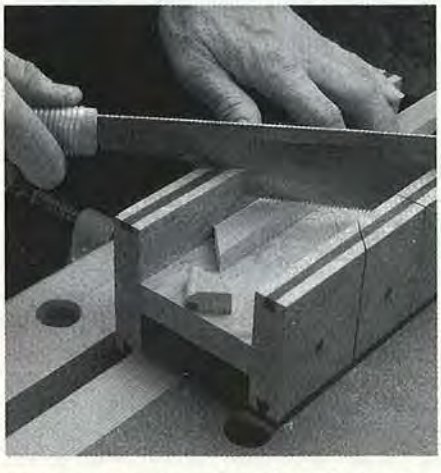
1 To make the front and side frame members (A, B), rip four 1"-wide strips of ½" cherry 20" long as laid out on the Cutting Diagram on page 56. (It's easier and safer working with the long strips.) Rout a bead along one edge of each strip as shown on the Step 1 Drawing at *upper right*.

2 Using the Step 2 Drawing as a guide, rout a ¼" rabbet 3/16" deep in each frame strip where indicated. (You also can cut the rabbet on a table saw with a dado blade.)

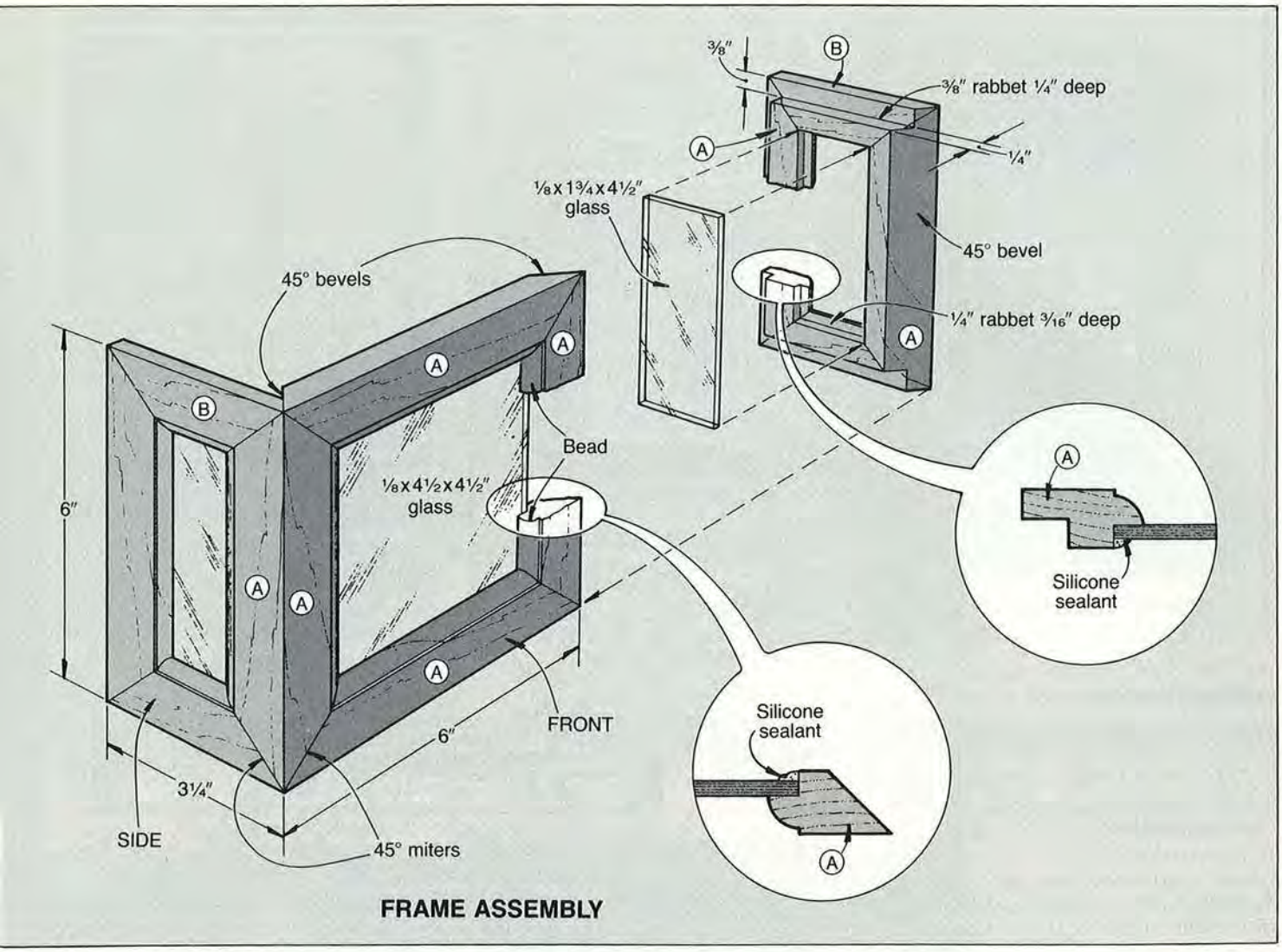




3 Using a miter box, cut the eight A's and four B's to length as shown in the photo *below*. (We used a Japanese saw that cuts on the pull stroke to cut the pieces.)



Cut frame parts to length with a miter box and fine-tooth saw.



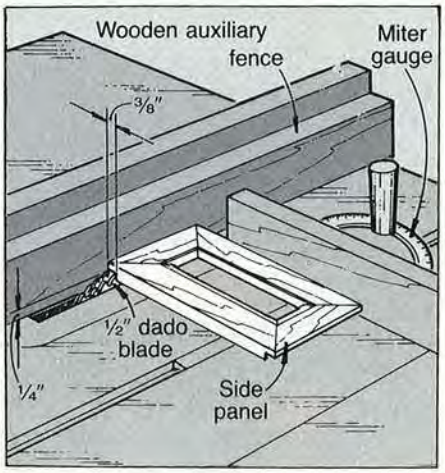
FRAME ASSEMBLY

4 To assemble the three cherry frames, spread glue on the mitered ends, and "clamp" them together (good face up) on a piece of scrap wood as shown in the photo *below*. (We found the frames too small and clumsy to clamp by ordinary means.) Wipe off the excess glue at each mitered joint with a damp cloth. Later, remove the frames, and sand each frame smooth.

Nail frame parts to scrap to "clamp" them together tightly.

JOINING THE FRAMES

1 Mount a dado blade to your table saw. Using the miter gauge, cut a 3/8" rabbet 1/4" deep on the top, bottom, and back edges of both *side* frames as shown in the drawing *below*. (Don't rabbet the front frame.)



2 Switch back to a 1/8" blade in your table saw, and tilt the blade to 45° from center. Now, bevel-rip the *front* edge of each side panel and *both side* edges of the front panel. (Do not narrow the width of the panels when ripping.)

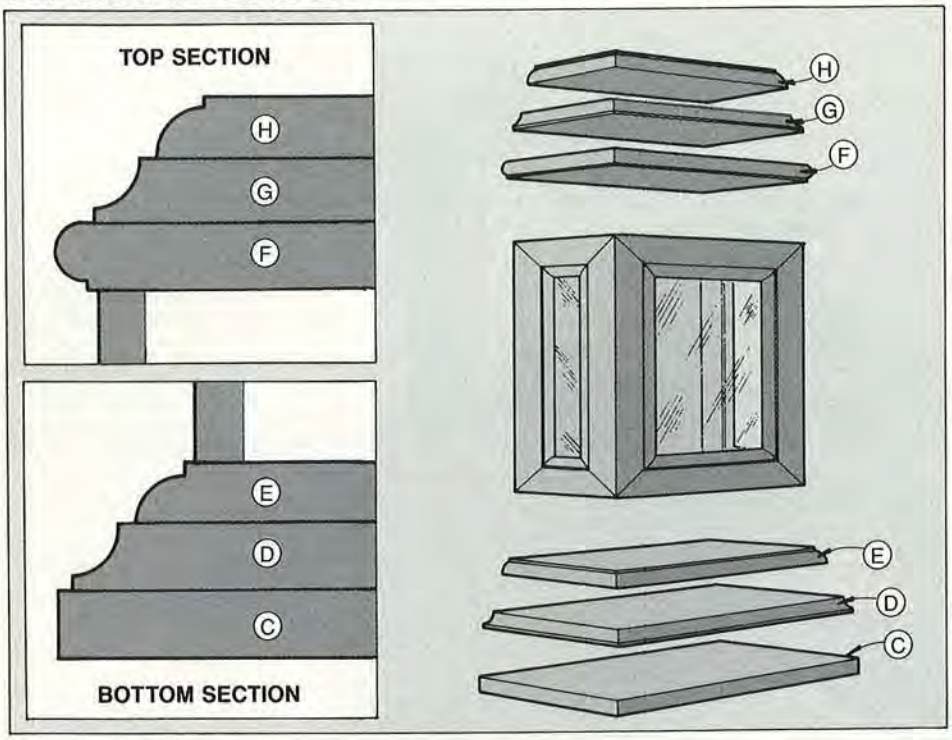
3 To form the U-shaped framework, glue and tape the side frames to the front frame, checking for square. (We used duct tape to hold the frames together until the glue dried. We also used a scrap spacer between the side frames to hold them square to the front frame while the glue dried.) Later, scrape off any squeeze-out, and lightly sand the assembly smooth.

FORMING THE TOP AND BASE

1 Rip and crosscut the base and top parts (C, D, E, F, G, H) to the sizes listed in the Bill of Materials.

Continued

MANTEL CLOCK

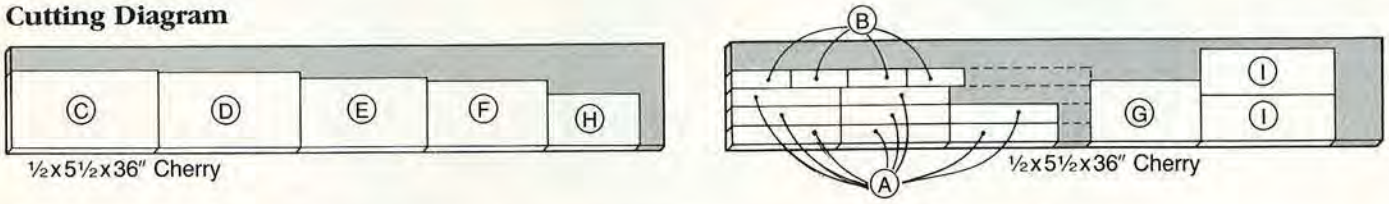


Bill of Materials					
Part	Finished Size*			Material	Qty.
	T	W	L		
A*	½"	1"	6"	cherry	8
B*	½"	1"	3¼"	cherry	4
C	½"	4¼"	8⅛"	cherry	1
D	½"	4⅛"	7⅞"	cherry	1
E	½"	3¾"	7"	cherry	1
F	½"	3⅝"	6¾"	cherry	1
G	½"	3¼"	6"	cherry	1
H	½"	2¾"	5"	cherry	1
I	1"	2½"	5½"	cherry (laminated)	1
J	¼"	5½"	6"	hardboard	1

*Parts marked with an * are cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.

Supplies: ⅛x5x6" mirror, 2 — ⅛x1¾x4½" glass, 1 — ⅛x4½x4½" glass, 4 — #2x1" flathead wood screws, clear silicone sealant, double-faced tape, finish

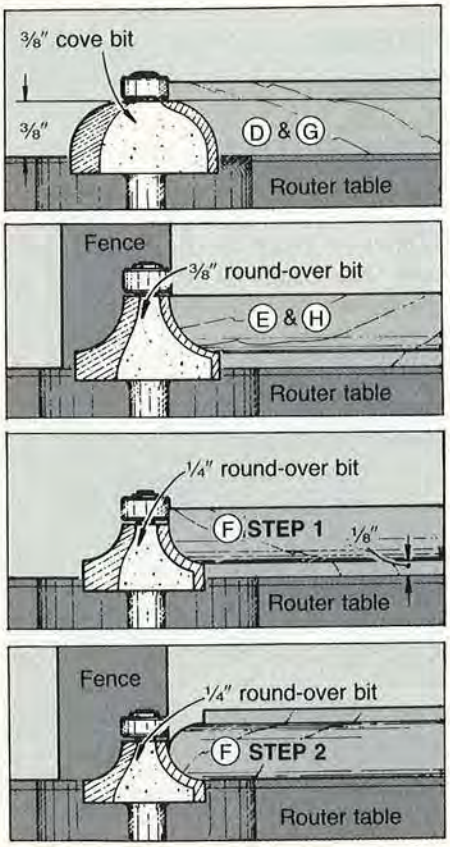
Cutting Diagram



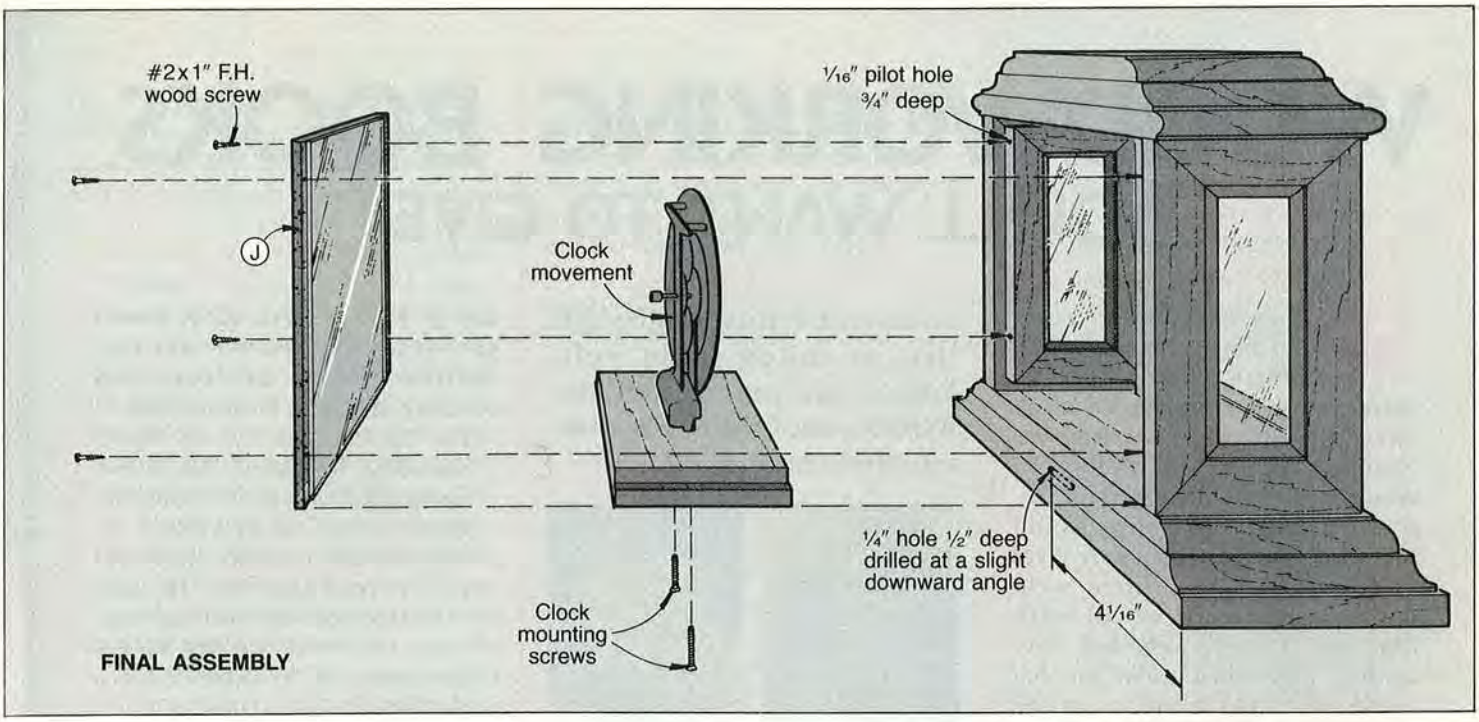
2 Rout a cove on the *front* and *side* edges of parts D and G, using the *top* drawing at *right* as a guide.
3 Switch bits and, using the drawing second from the top as a guide, rout a bead on the *front* and *side* edges of parts E and H.
4 Now switch to a ¼" round-over bit, and make the routing cuts shown on the two-step drawing *below right* to form the decorative edges on part F.
5 Sand the routed pieces smooth. With the back edges flush, glue, center, and clamp part D to C, and then later, part F to the C-D assembly. Repeat this process to laminate G to F, and later, H to the G-F assembly. Wipe off any squeeze-out with a damp cloth immediately.

FINAL CUTTING AND ASSEMBLING

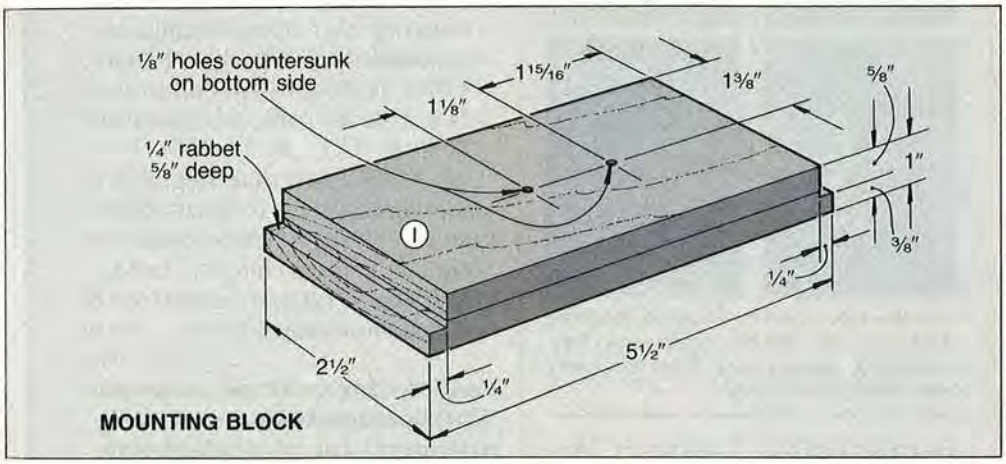
1 With the back edges of the base and framework flush, glue them together, centering the framework from side to side. After the glue has dried, remove the clamps and repeat the process to mount the top to the framework.



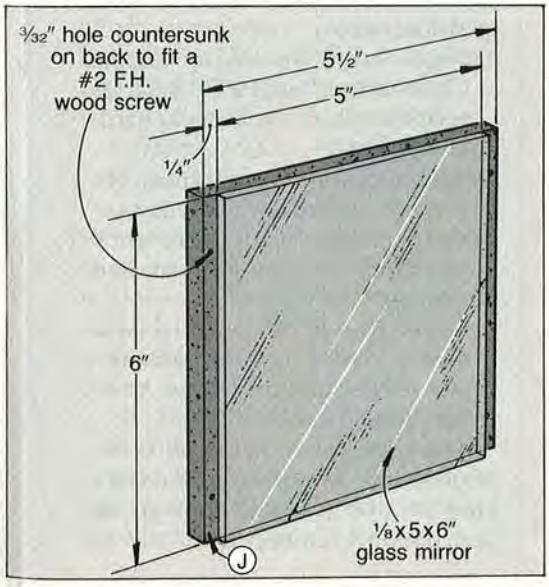
2 To make the mounting block (I) for the clock movement, cut two pieces of ½"-thick cherry to 2½x5½". Laminate the two pieces face-to-face with the edges flush. After the glue dries, remove the clamps, and cut or rout a ¼" rabbet ⅝" deep across the ends where shown on the Mounting Block Drawing at *right*. Check the fit of the mounting block in both rabbeted grooves in the clock housing (top and bottom); trim if necessary.
3 Drill and countersink a pair of ⅛" holes through the mounting block where dimensioned on the Mounting Block Drawing.
4 Cut the hardboard back (J) to fit into the rear rabbeted opening. Using the drawing at *right* as a guide, drill and countersink four 3/32" holes through the hardboard back for fastening to the back side of the clock housing later.



FINAL ASSEMBLY



MOUNTING BLOCK



5 Have a mirror cut to size, and fasten it to the hardboard back (we used double-faced tape). Get the three glass panels cut to size for the framework at the same time.

6 Stain and finish the cherry clock pieces as desired. Position the glass panels in the rabbeted frames, and secure the glass panels in place with clear silicone sealant as detailed on the Frame Assembly Drawing on page 55. Now, mount the clock movement to the mounting block. If you choose to place the clock on a mantel or shelf, you simply slide the mounting block (I) into the bottom rabbet. If you prefer to wall-mount the clock, slide the mounting block into the opposite rabbet. You'll hang the clock with the wide end up, as shown in the small opening photo on page 54.

7 Position the hardboard back in the rear-rabbeted opening. Using the previously drilled holes as guides, drill 1/16" pilot holes 3/4" deep into the clock housing. Now, fasten the hardboard back (with the mirror attached) to the back of the clock housing.

8 If you plan to hang the clock on the wall, drill a 1/4" hole 1/2" deep at a slight angle where shown on the Final-Assembly Drawing, *above*.

BUYING GUIDE

- **Quartz skeleton movement.** Complete with brass time ring, catalog no. 10050, $26.95. Requires one N battery, catalog no. 45004, 85 cents each. Movement and battery, $27.80 plus $3.30 shipping from Klockit, P.O. Box 629, Dept. WD12, Lake Geneva, WI 53147.
- **1/2" cherry.** 2 pieces measuring 1/2x5 1/2x36", catalog no. W4559, $8.89 each, $4 shipping. Craftsman Wood Service, 1735 W. Cortland Ct., Addison, IL 60101 or call 312/629-3100.

Produced by Marlen Kemmet
Project Design: James R. Downing
Photographs: William Hopkins
Illustrations: Kim Downing; Bill Zaun

Print this article

WOODWORKING BOOKS YOU'LL WANT TO GIVE

Woodworkers never seem to have enough books. That's why books make perfect gifts. Here at *WOOD*, we all have our special favorites we wouldn't hesitate to bestow on woodworking friends (see box, *opposite*). But what books would other woodworkers choose to give?

We picked half a dozen well-known woodworkers, all with different backgrounds and specialties, and asked them the big question: *"What book or books from your field of woodworking would you give to a beginner with similar interests?"*

Roger Cliffe, De Kalb, Illinois; professor of industrial arts, Northern Illinois University, author, and custom cabinet shop owner.

- *Encyclopedia of Furniture Making*, by Ernest Joyce, 1987, Sterling Publishing Co., Inc., New York, hardcover, $19.95.

"This isn't a project book, but it shows how things go together. Excellent line drawings actually help you build things or give you hints to design your own projects."

- *The Woodfinisher's Handbook*, by Sam Allen, 1985, Sterling Publishing Co., Inc., New York, softcover, $9.95.

"This tells you all you need to know, from working the bare wood to obtaining the finest finish luster."

- *The International Book of Wood*, edited by Martyn Bramwell, 1984, Crescent Books, New York, hardcover, $29.95.

"This is the neatest book I own. It tells you how wood has been used in different countries over the centuries. Don't read it cover to cover, but keep it within reach next to your armchair."

To assemble this holiday gift list, we asked some well-known craftsmen, and the *WOOD* staff, for their recommended reading.

Clockwise: **Carver Harold Enlow, designer Ian Kirby, craftsman Roy Underhill, wood expert Paul McClure, and others, offer advice.**

Harold Enlow, Dogpatch, Arkansas; woodcarver, instructor, and author.

- *Carving Animal Caricatures*, by Elma Waltner, 1972, Dover Publications, Inc., New York, softcover, $3.95.

"It's a good beginner book. Everybody seems to like it, and that's why I do. Most everyone finds it a fun book with appealing designs and patterns.

"My favorite of the books I've written is for novice carvers:"

- *How to Carve Faces in Driftwood.* (Note: Harold's book is self-published. To order, write: Enlow Woodcarving, P.O. Box 34, Dogpatch, AR 72648. Price is $10.20, including postage.)

Ian J. Kirby, Cumming, Georgia; designer, cabinet and furniture maker, author, and teacher at Kirby Studios, Ltd.

- *The Nature and Art of Workmanship*, by David Pye, 1968, Cambridge University Press, England, softbound, $12.95.

"Every woodworker in the world ought to read this one. He gets you to think about workmanship. He says that workmanship adjusts to the nature of the times. Pye is a woodworker who writes."

- *On How To See, a Guide to Reading Our Man-Made Environment*, by George Nelson, 1979, Little Brown Publishers, Inc., New York, softbound, $14.95.

"I'm concerned that beginning woodworkers have a visual education, too. George Nelson is one of America's great architects. And he gives you a visual experience through photographs."

Paul McClure, Gilbert, Arizona; *WOOD* magazine's wood technologist, former wholesale hardwood buyer, woodworker, and instructor.

- *Know Your Woods*, by Albert Constantine, Jr., 1975, Charles Scribner's Sons, New York, hardcover, $12.95.

"A real good one for a layman. He covers all the woods you can possibly ever get and where they come from. It's easy to read, and entertaining as well."

- *World Woods in Color*, by William A. Lincoln, 1986, Macmillan Publishing Co., New York, hardcover, $29.95.

"For the beginner, it has all color photographs of different wood. It's kind of like walking through an international lumberyard."

Roy Underhill, Williamsburg, Virginia; master housewright at Colonial Williamsburg, host of a PBS television series, author.

- *Dictionary of Tools Used in the Woodworking and Allied Trades, 1700-1970,* by R.A. Salaman, 1976, Charles Scribner's Sons, New York, hardcover, $60.

"545 pages filled with nothing but old hand tools! It's great!"

- *With Hammer in Hand, the Dominy Craftsmen of East Hampton, New York*, by Charles F. Hummel, 1976, University Press of Virginia, Charlottesville, Va., hardcover, $25.

"A real immersion into the world of traditional craftsmen."

- *The Wheelwright's Shop*, by George Sturt, 1976, Cambridge University Press, Cambridge, England, softcover, $11.95.

"I like people books that get you involved with thoughts as well as processes. My favorite quotation from this book: 'They were friends with oak and iron as only craftsmen can be. The grain of the wood told secrets to them.' "

Russ Zimmerman, Putney, Vermont; woodturner, teacher, and author.

- *Creative Woodturning*, by Dale Nish, 1980, Brigham Young University Press, Provo, Utah, softcover, $12.95.

"For inspiration. It has a nice bunch of projects with lots of photographs for beginning turners."

- *Turning Wood with Richard Raffen*, 1985, The Taunton Press, Newtown, Conn., softcover, $17.95.

"It explains and describes the work of one of the few well-recognized, legitimate turners who happens to be widely known."

- *Zimmerman Woodturning Letters*, by Russ Zimmerman, set of 12, $30, from Russ Zimmerman, RFD 3, Box 242, Westminster West Rd., Putney, VT. 05346.

"For technical detail you can't get anywhere else."

BEST READ BOOKS FROM THE WOOD STAFF

It took only a short memo to find out what woodworking books the staff place high on the gift list for fellow craftsmen.

Larry Clayton, Editor

- *Understanding Wood, a Craftsman's Guide to Wood Technology*, by R. Bruce Hoadley, 1981, The Taunton Press, Newtown, Conn., hardcover, $21.95.

"A terrific book of very technical, but necessary information presented for the average woodworker to understand."

Charles E. Sommers
Managing Editor

- *Working with Wood*, by Gilbert R. Hutchins, E. Eugene Martin, and J. Mario Coleman, 1982, McKnight Publishing Co., Bloomington, Ill., hardcover, $19.95.

"Written as a broad, instructional text, it covers all phases of woodworking from planning to finishing. A thorough, basic reference."

C. L. Gatzke
Art Director

- *Making Woodworking Aids & Devices*, by Robert Wearing, 1985, Sterling Publishing Co., Inc., New York, softcover, $8.95.

"There are books on both projects and tools. This one, though, helps you make the most of the tools you have so you can build projects easier."

James R. Downing
Design Editor

- *Modern Woodworking*, by Willis H. Wagner, Clois E. Kicklighter, 1986, Goodheart-Wilcox Co., Inc., South Holland, Ill., hardcover, $22.

"It's complete and, just as importantly, up-to-date regarding tools and materials."

Peter J. Stephano
Features Editor

- *Adventures in Wood Finishing*, by George Frank, 1981, The Taunton Press, Newtown, Conn., hardcover, $9.95.

"Frank writes as entertainingly as a novelist, yet tips and techniques come across."

Marlen Kemmet
How-to Editor

- *Sculpting Wood*, by Mark Lindquist, 1986, Sterling Publishing Co., Inc., New York, hardcover, $29.95.

"Great photography here, plus lots of tips and a few projects. A different, interesting type of book on woodturning."

Jim Barrett
Buymanship/Techniques Editor

- *Technical Woodworking*, by Chris H. Groneman, Everett R. Glazner, 1975, McGraw Hill Book Co., New York, hardcover, $29.50

"This was my old college textbook, but I still frequently refer to it because it covers everything."

James E. Boelling
Project Builder

- *Cabinetmaking and Millwork*, by John L. Feirer, 1982, Bennett Publishing Co., Peoria, Ill., hardcover, $28.50

"A real comprehensive text — from design to manufacture."

Perry A. McFarlin
Graphic Designer

- *The Woodwright's Shop, A Practical Guide To Traditional Woodcraft*, by Roy Underhill, 1981, The University of North Carolina Press, Chapel Hill, N.C., softcover, $11.95.

"Roy makes old ways come to life again – with a bit of humor."

Produced by Peter Stephano

Your Quick-Reference To

CARBIDE-TIPPED CIRCULAR

Have you checked the prices of carbide-tipped blades lately? Not too long ago you would have paid anywhere from $60 to $100 for a 10″ blade. Today, you can get one for as little as $20.

Sure, this trend bears good news for us home woodworkers. But it also raises several questions. For instance, with blades ranging from $20 to $120 and up, you're bound to find whopping differences in quality. So, how do you know if you're really getting what you pay for? And with so many different kinds of blades on the market, how do you determine which ones (and how many) best suit your needs?

This guide will help you answer these questions. But, before reading on, familiarize yourself with the terms we use by studying the blade illustrated *below*.

Print this article

HOW TO SPOT A QUALITY SAW BLADE

You can see *some* of the qualities of a good blade just by looking. But to determine others, such as the materials and workmanship that go into the blade body, you'll need to search the manufacturers' literature for clues. Here's what to look for:

- **Better blades have bigger tips**

When looking at blades of the *same* type, compare the size of the carbide tips. High-quality blades generally have larger tips so they'll take more sharpenings. And, the larger the tips, the more abuse they'll take because they're less likely to chip or break off.

On the other side of the coin, you can replace inexpensive "throwaway" blades for about the same price it would cost to sharpen them. But we suggest you save up your coins to buy the best blades you can afford; you'll be happier with their overall cutting performance. Besides their short life, the cheap ones just don't cut as well.

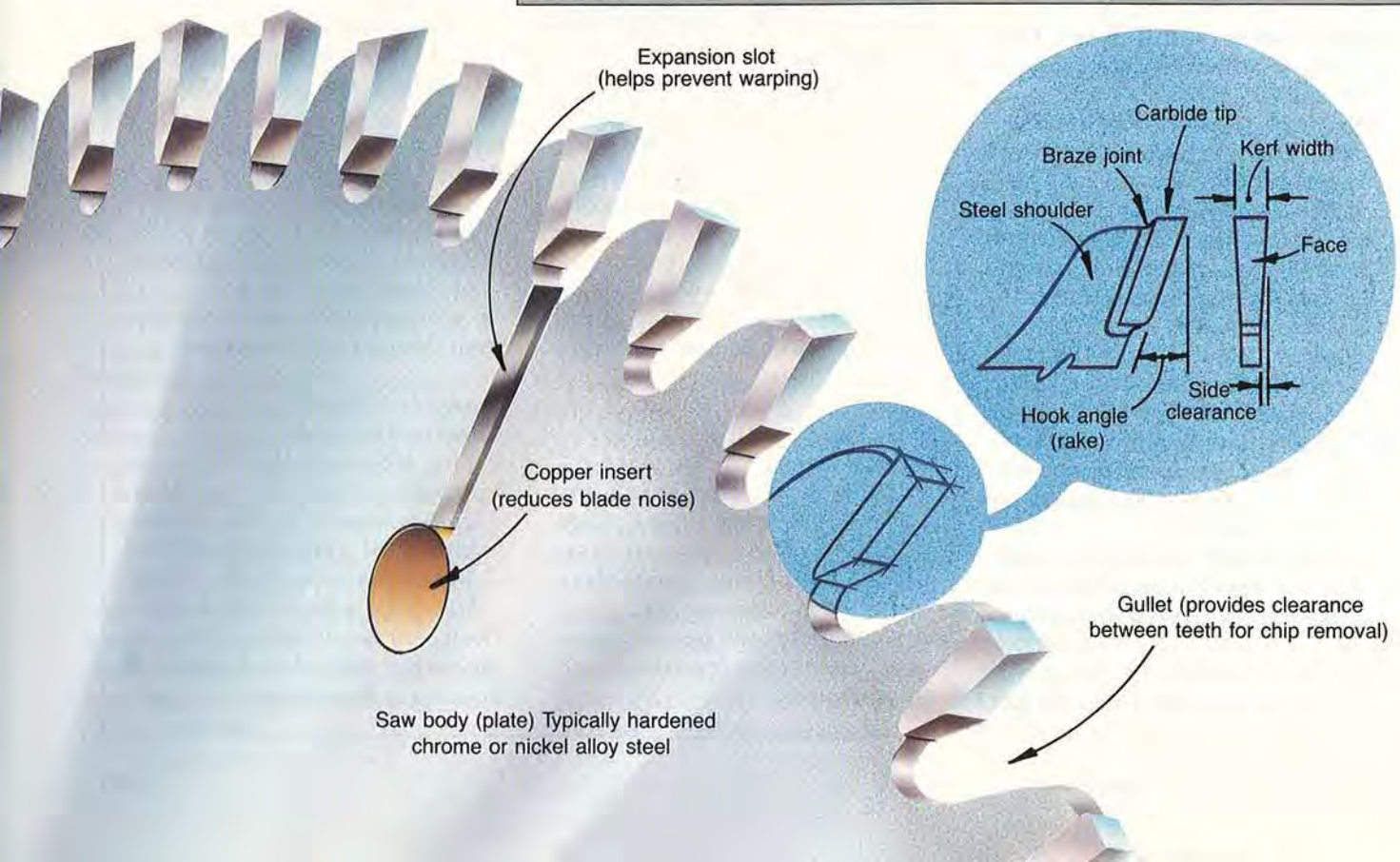
- **Look for smooth tips**

Inspect the tip surfaces—with 5x or 10x hand lens, if possible. Tips with visible scratches or coarse, uneven grind lines have a dull cutting edge to begin with, and will continue to dull more quickly than those with smooth surfaces.

Blade manufacturers use diamond abrasive wheels to grind the carbide tips. To make high-quality blades, they use 400- to 600-grit wheels to grind the top and face surfaces of the tips. Cheaper blades are finish-ground with coarser 180- to 220-grit wheels.

- **Check the braze joints—for safety's sake**

No matter how good the tips are, you don't want them flying off the blade while you're sawing. On high-quality blades you'll find the tips neatly brazed into deep pockets cut into the saw teeth (see the drawing *below*). Avoid blades with rough or pitted braze joints.



SAW BLADES If You Feel Swamped with Choices, Here's Help!

• The saw body: milling makes a difference

Blades with a body made of milled, heat-treated steel outlast and outperform those with a stamped-steel body. On premium blades, the manufacturer carefully tensions and grinds the body, then checks it for balance. Tensioning a blade relieves stresses in the metal so the body will stretch evenly during operation.

Better blades generally have a thicker body than their equivalent in the low-end blades. Most also have *expansion slots*. They allow the blade to expand and contract without warping. The slots usually end with a hole to help keep the blade from cracking. As detailed in the drawing on the facing page, note that some manufacturers plug the holes with a soft metal, such as copper, to make them run more quietly. All of these factors minimize blade warp (runout) and vibration during operation.

Note: You can improve the cutting performance of almost any blade. Simply use a dampener or stiffener. These circular plates, about 1/3 to 1/2 the blade diameter, add rigidity to the blade body to reduce vibration. Depending on their design, you attach them to one or both sides of the blade when you install it in the saw.

• Harder carbide means longer blade life

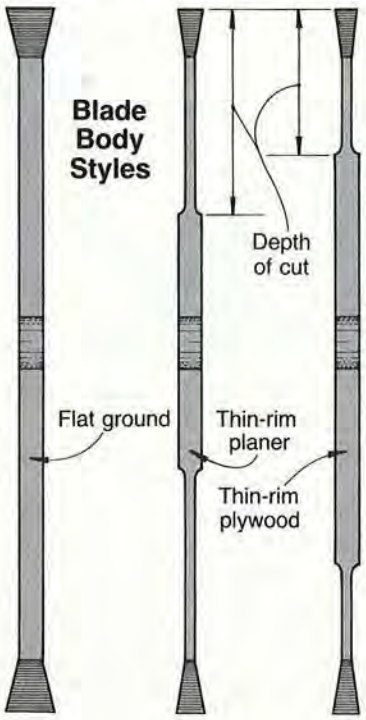
The better blades usually use a harder grade of carbide than the less costly ones. The carbide grades in saw blades range in hardness from C1 (softest) to C4 (hardest).

Although harder carbide tips hold a cutting edge longer than the softer grades, they're also more brittle. So, manufacturers of premium blades carefully match carbide hardness to blade application. And, they usually indicate the hardness of the tips in their literature.

THIN-KERF BLADES: Smooth, stingy cutters

Most carbide blades cut a kerf about 1/8" wide, give or take a few thousandths of an inch. *Thin-kerf blades* cut one about half that width. Use these specialized blades for chip-free cuts on expensive woods when you want to keep material loss at a minimum.

The drawing at *right* compares the profile of standard flat-ground blade with two common types of thin-kerf blades: a *thin-rim planer* blade and a *thin-rim plywood* blade. Thin-kerf blades also have smaller carbide tips, with less side clearance than standard-width blades, which provide a smoother cut. But the tips won't take as many sharpenings as a conventional carbide blade, so avoid using them for general cutoff work. You can use only the thin portion of the blade for cutting, so there's a limit to the depth of cut they can make.



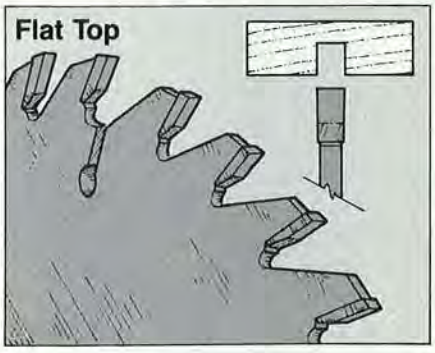
CHOOSING THE RIGHT BLADE FOR THE JOB

If you're used to buying steel blades, you may have noticed that their carbide counterparts don't fit into the same neat categories. Sure, you can rely on the designations and descriptions found in manufacturers' catalogs or on the saw blade package. But, in some cases, you'll find such descriptions sketchy, and they'll vary from one blade maker to the next.

The shape, or *grind,* of the carbide tip plays the key role in determining which blades work best for each cutting operation. We found that most carbide blades designed for cutting wood fit into one of four basic tip-grind configurations: *Flat top (FT), alternate-top bevel (ATB), alternate-top bevel and raker (ATB&R),* and *triple chip (TC).*

FLAT TOP (FT)—For ripping only

You'll find this tooth grind (shown *below*) on blades designed for fast, heavy-duty ripping. Deep gullets separate the teeth, which are ground to an aggressive 20° hook angle. Most 10" FT rip blades have 10 to 30 teeth (24 teeth being most common).



We recommend you not use FT blades for crosscutting. The flat, chiselike teeth leave a fuzzy end-grain surface and splinter the edges of the cut. They're also poor performers on plywood, particleboard, and other materials that easily splinter or chip out.

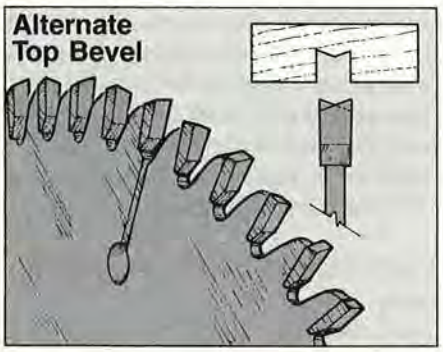
Continued

CARBIDE-TIPPED CIRCULAR SAW BLADES

ALTERNATE-TOP BEVEL (ATB)—For clean crosscuts

Alternately beveled teeth cut with a shearing action, producing a smooth cut *across* the grain in hardwoods, softwoods, plywood, and wood composition materials.

On ATB blades, both the bevel angle and number of teeth determine the smoothness of cut. For instance, a steep bevel angle (15° to 20°) gives the tip an extremely sharp point, which practically eliminates splintering and tearout on the bottom side of the stock. But tips with steep angles will dull more quickly than those with lower angles, so you'll have to sharpen them more frequently.

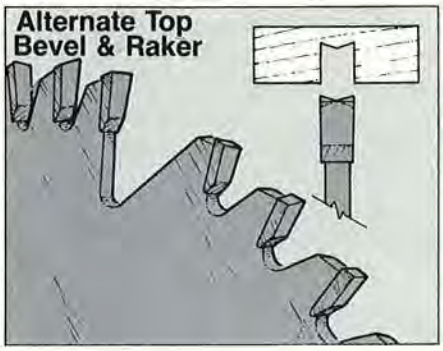


Choose a 40-tooth blade for general crosscutting on dimensional stock at a moderately fast feed rate, and for shallow ripping and trim cuts with the grain. A 60-tooth blade gives an even smoother cut, but at a slower feed rate. Make an 80- to 100-tooth blade your choice for glass-smooth cutoffs and miters on thin or fragile materials, such as picture frame moldings and veneered plywoods.

ALTERNATE-TOP BEVEL AND RAKER (ATB&R)—The best all-around blade

You'll commonly find this tooth grind configuration on general-purpose combination blades. ATB&R blades make fairly smooth cuts *with* and *across* the grain.

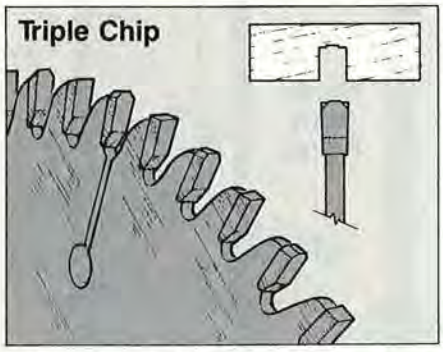
The most common tooth pattern, shown in following illustration, has one flat-top raker tooth followed by four alternately beveled cutting teeth. A deep gullet for fast chip removal separates each set of teeth. Other ATB&R tooth configurations consist of two to eight ATB teeth for each raker, with or without the deep gullet.



Typically, 10″ ATB&R blades come with about 50 teeth. They make reasonably smooth rips, crosscuts, and miters in hardwoods, softwoods, plywood, and wood composition materials. If we had to recommend one all-purpose blade, this is the one we'd go with.

TRIPLE CHIP (TC)—For tough materials

This tooth design works best for general cutting chores on woods, solid plastics, plastic laminates, and other hard, abrasive materials. As with other blades, the more teeth, the smoother the cut.



We found that TC blades don't crosscut wood quite as smoothly as ATB or ATB&R blades. But on the positive side, the more-durable teeth cut a wider range of materials without dulling as quickly. For example, most manufacturers offer blades with this tooth grind for smooth, nearly chip-free cuts in single- or double-sided plastic-laminated sheet goods (such as Formica).

HOW MANY BLADES DO YOU NEED?

Despite any manufacturer's claims you may have heard, you'll find that no one blade cuts perfectly in all situations. But, as mentioned earlier, we've found that a 50-tooth ATB&R combination blade comes closest to a do-it-all blade. For this reason, this is the standard blade you'll find on our table saw.

Because we use our radial arm saw primarily for general crosscut work, we usually equip it with a 50- to 60-tooth ATB blade. For fine cutoff work, go with more teeth. Or, you can choose one of the specialized blades discussed below.

Generally, these three blades will handle most cutting situations in the home shop: a 24-tooth FT rip blade, a 50-tooth ATB&R blade, and a 60- to 80-tooth ATB blade. Try these out for starters. Then, if you find you need more specialized blades, buy the best you can afford.

BLADES FOR RADIAL ARM AND MITER SAWS

Watch the hook angle!

You can use many of the same blades on a radial arm saw that you can on a table saw, with these exceptions: For ripping operations on radial saws, the hook angle should not exceed 15°. The smaller the angle the less chance the work will lift and kick back. For crosscutting, choose a blade with a hook angle of 10° or less. Blades with larger hook angles tend to overfeed, causing the blade to jam.

Blades suitable for power miter saws and chop saws usually have an ATB tooth design and a hook angle of 7° or less. Depending on the smoothness of cut you want, you can choose a blade with 40 to 100 teeth. Some manufacturers offer cutoff blades designed especially for radial arm saws and miter saws, such as the DML Radi-All and Miter-All blades, Freud's LU85M, the Woodworker II from Forrest, and the Chop Champ from Systi Matic.

Written by Jim Barrett
Technical Consultant: George Granseth
Illustrations: Taylor & Associates; Bill Zaun

SANTA'S GALLERY OF GIFTS

An exciting 18-page array of easy-to-build projects guaranteed to bring smiles of appreciation to the faces of those lucky folks on your "Very Important Persons" list

Display your favorite Vintages in Our

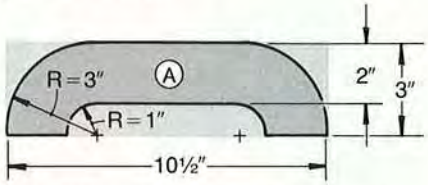
SHOWCASE WINE RACK

With room for eight bottles of your finest wine and just as many stemware glasses, this free-standing unit makes exceptionally good use of a small amount of space. And guess what? It's a snap to build as the joinery can be easily accomplished with a doweling jig and dowel pins. Why not make several and treat a friend or relative to this special gift?

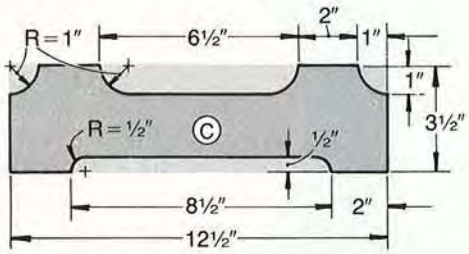
Print this article

FORMING THE END FRAMES

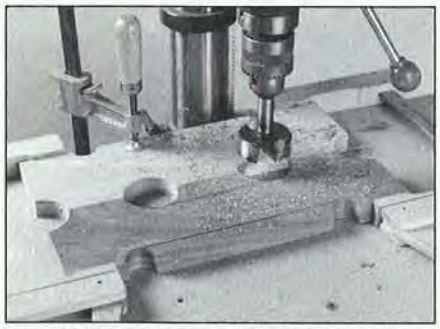
1 Cut the top pieces (A), uprights (B), and bases (C) to the sizes listed in the Bill of Materials for the two end frames. Then, using the drawing *below* for reference, mark the radii for all of the curves on the tops and bases.



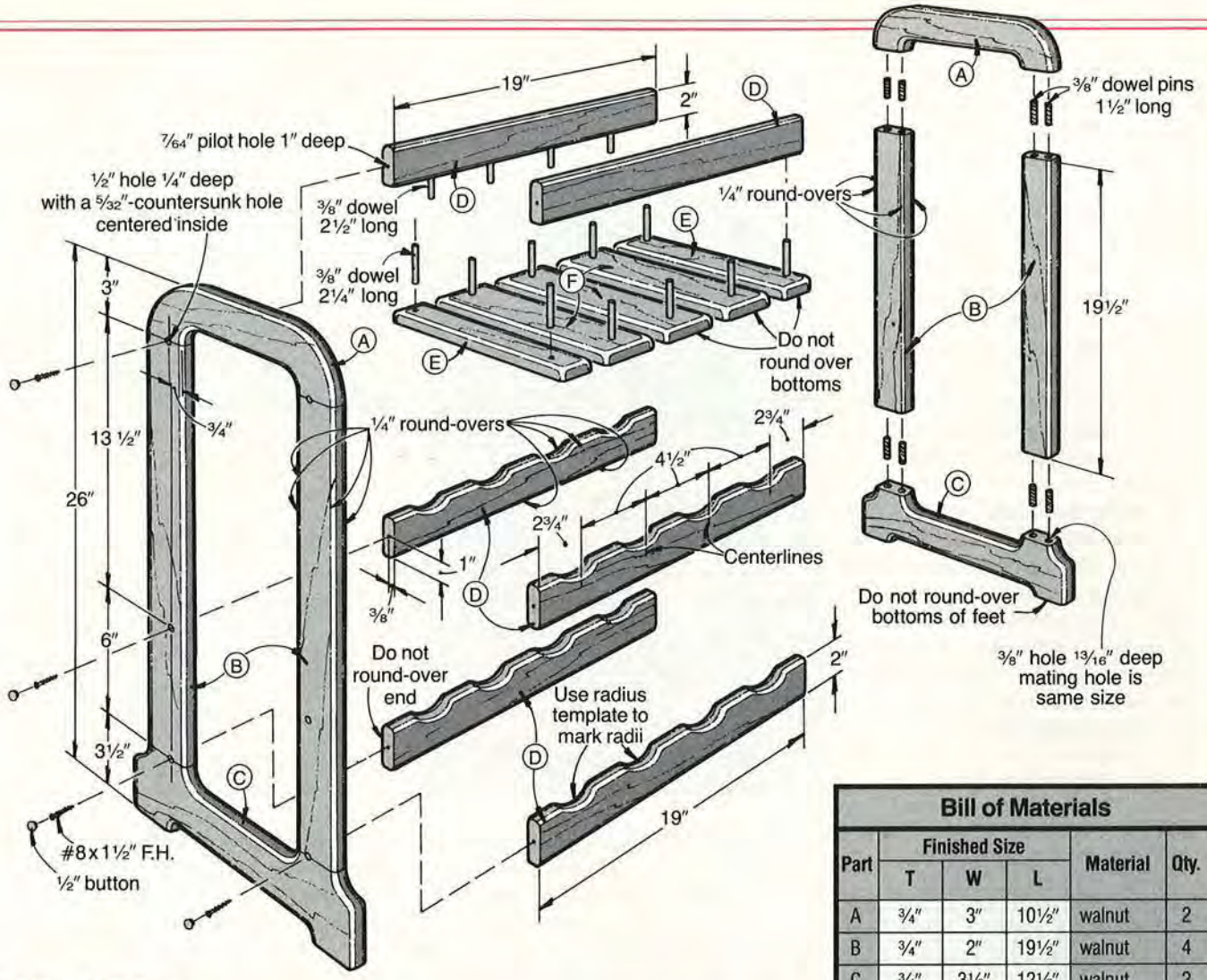
TOP AND BASE PARTS VIEW



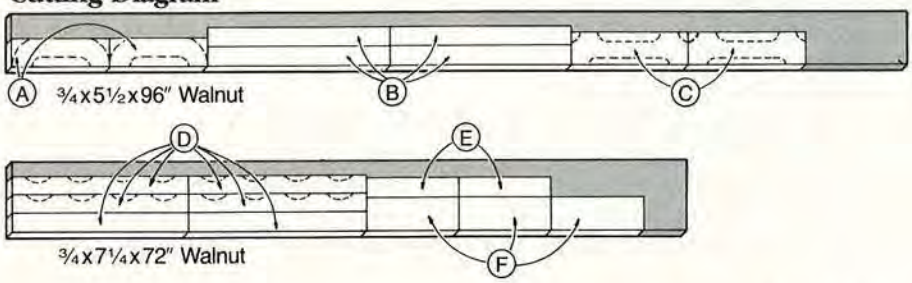
2 Cut a piece of scrap that's at least as long as the base pieces (12½″). Now, clamp the scrap to the bottom edge of one of the base pieces as shown in the photo *below.* Clamp these two pieces to your drill press table, and bore the two 1″ holes and four 2″ holes where marked to form the radii. Repeat these operations on the other base. (If you don't have the 1″ and 2″ drill bits, you can cut the radii to shape on a band saw.)



Bore holes in the walnut base pieces with a Forstner bit to form the 1″- and 2″-radii curves.



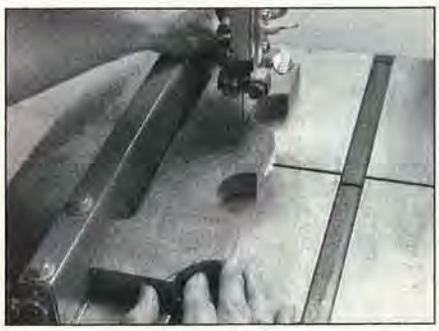
Cutting Diagram



Bill of Materials

Part	Finished Size T	W	L	Material	Qty.
A	¾″	3″	10½″	walnut	2
B	¾″	2″	19½″	walnut	4
C	¾″	3½″	12½″	walnut	2
D	¾″	2″	19″	walnut	6
E	¾″	2¾″	9¾″	walnut	2
F	¾″	3½″	9¾″	walnut	3

Supplies: ⅜″ dowel pins 1½″ long, ⅜″ walnut dowel stock, ½″ walnut wood buttons, #8x½″ flathead wood screws, #8x¾″ flathead wood screws (for template), polyurethane sanding sealer, polyurethane, 0000 steel wool, paste wax



To complete the curved cutouts, band saw between the drilled holes using the saw's fence as a guide.

3 Using your band saw and a fence, cut straight lines between the holes to shape the bases as shown in the photo at *left*.

4 Repeat the boring and cutting process (steps 2 and 3) to shape both top pieces of the end frames.

5 Dry-clamp the pieces of each end frame together, and mark dowel hole reference lines where dimensioned on the drawing on *top* of the *next* page. Remove the clamps after making the marks.

6 Using a doweling jig, drill ⅜″ holes 13/16″ deep where marked on the end frame parts. Glue, dowel, and clamp each end frame together.

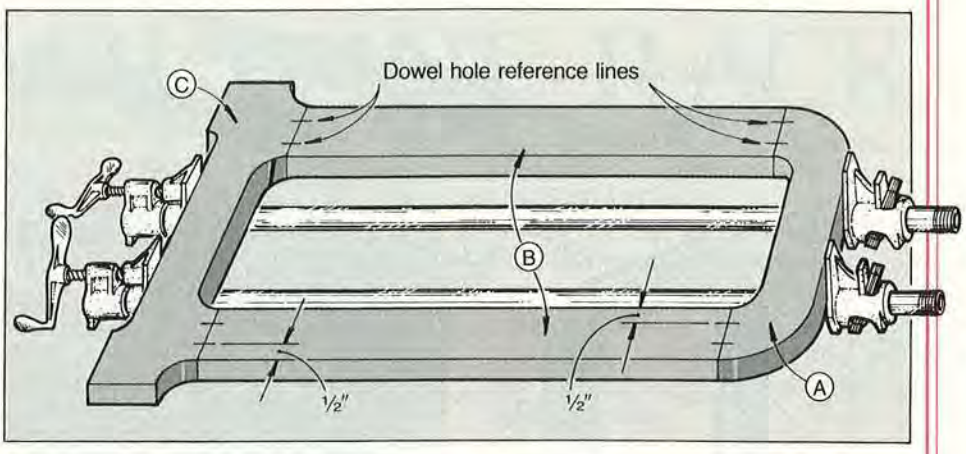
7 Using the dimensions and hole sizes on the Exploded-View Drawing, drill six plug and shank holes in each end frame for attaching the cross members (D) later.

8 Sand each end frame smooth (we used a 2″-diameter drum sander on the inside radii and a palm sander on the other surfaces). Now, rout a

Continued

WINE RACK

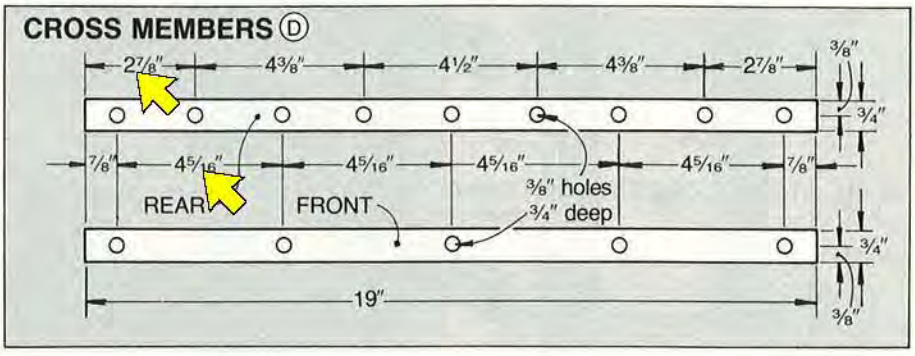
¼" round-over on all but the bottom edges of the feet of both end frames. Finish-sand each end frame.

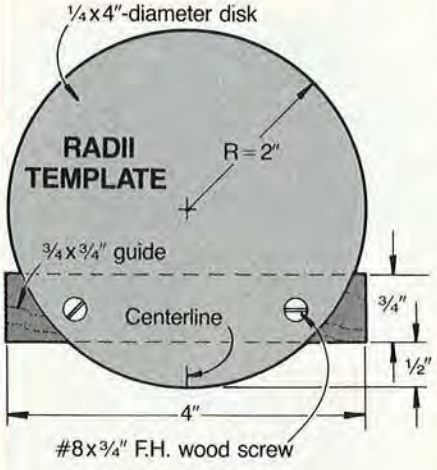


SHAPING THE BOTTLE RESTS

1 Cut the four bottle rests and the two top cross members (D) to 2x19". Mark diagonals on each *end* of each piece to find the center, and drill a 7/64" pilot hole 1" deep at each of the center points. (Be careful to keep the hole at a right angle to the surface being drilled.) Set aside the two top cross members; you'll use them later.

2 To mark the radii on the four bottle rests, first make the template shown on the drawing *below.* Mark centerlines on each bottle rest where dimensioned on the Exploded-View Drawing. Align the centerline on the template with those on each bottle rest, and mark four radii on each bottle rest.





3 Cut the radii to shape on the band saw. Use a drum sander to sand the radii smooth. Then, rout a ¼" round-over along all edges, but not the ends. Finish-sand the four bottle rests.

NOW, BUILD THE STEMWARE SUPPORTS

1 Cut the two walnut end supports (E) and three inner supports (F) to size.

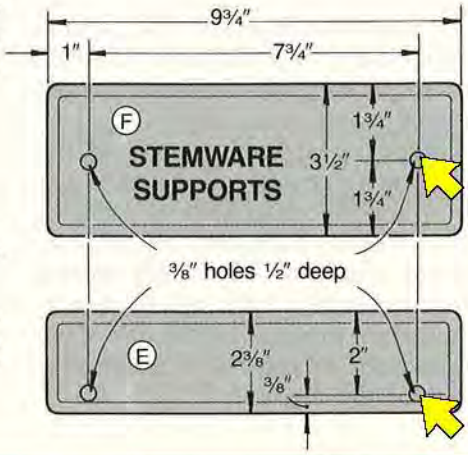
2 Using the drawing at *right,* mark the location of the dowel holes on each support. Drill a pair of ⅜" holes ½" deep in each support.

3 Rout a ¼" round-over along the top edges of each support and along all but the ends of the two remaining cross members (D). Sand the parts smooth.

4 Drill five holes in the front cross member and nine holes in the rear, using the dimensions and hole size on the drawing *above* (we drilled ours with a doweling jig).

5 Cut ten pieces of ⅜" walnut dowel stock to 2¼" long and four pieces to 2½" long.

6 Using the 2¼"-long dowels, glue and clamp the stemware assembly (D, E, F) together. Check that the supports are level with each other and square the assembly. Sand a round-over on one edge of each of the 2½"-long dowels. Glue the four dowels (rounded ends exposed) in the back cross member. These dowels prevent the glasses from sliding out the back.



FINAL ASSEMBLY

1 Spread an even coat of glue on the ends of each cross member, and screw the bottle rests (D) and stemware rack between the end frames. Wipe off any excess glue with a damp cloth. Glue ½" wood buttons in the screw holes.

2 Stain and finish as desired. (We applied two coats of polyurethane sanding sealer and three coats of polyurethane, steel-wooling between coats. Next, we used the steel wool to apply a coat of Minwax paste finishing wax. Finally, we buffed the wax with a cloth.)

Project Design: Marlen Kemmet
Photographs: William Hopkins; Jim Kascoutas
Illustrations: Kim Downing; Bill Zaun

The perfect mood setter for snowy winter evenings

CHIMNEY-TOPPED CANDLE HOLDER

Print this article

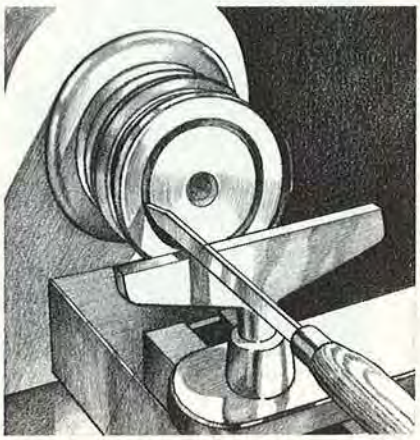
There's something about the flicker of candlelight that's so soothing to watch. Provide that relaxed feeling with our smart cherry base and a glass chimney. You'll have a project that's sure to warm someone's heart this holiday season.

1 Cut seven pieces of ¾" stock (we used cherry) to 5x5½" long. Glue and clamp the pieces together face to face, with the edges and ends flush. Let cure overnight.

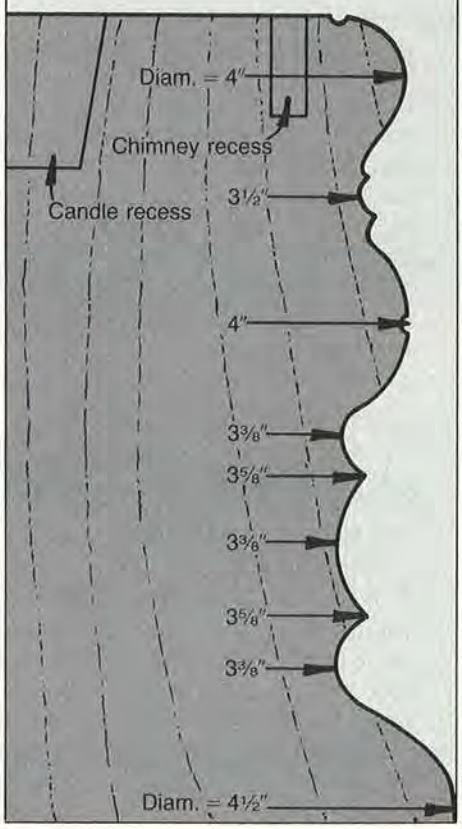
2 Set your table saw blade at 45° from center, and bevel-rip 1" off each of the four corners to make the lamination roughly octagonal in shape. This will make the lamination easier to turn round. Trim both ends of the lamination square (we did this on the radial arm saw).

3 Screw the lamination to the faceplate (we used a 3" faceplate with ¾" brass wood screws). Position the tool rest in front of the lamination. With the lathe running at about 800 rpm, round down the cherry lamination with a gouge until its diameter measures 4½".

4 Move the tool rest to the end of the candle holder, and form the candle and chimney recesses with a parting tool as shown in the drawing *below*. Check the fit of both the candle and the chimney in their respective recesses for a good fit. (The styles of chimneys vary and are available at most hardware and variety stores, or see the Buying Guide for our source.)



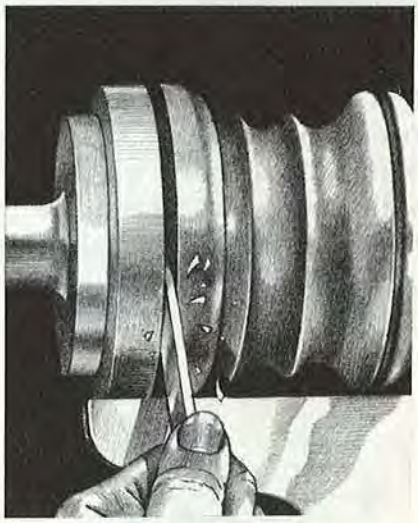
FULL-SIZE HALF PATTERN



5 Using the full-size half pattern or your own shape, turn the candle holder to shape (we used a ¼" and ½" gouge, a skew, and a parting tool). Allow enough space between the faceplate and the bottom of the holder to avoid hitting the faceplate screws when turning to shape.

6 Using a faster speed (we switched to about 1,500 rpm), finish-sand the candle holder. Slow the lathe to its slowest speed and apply the finish. (We used cherry stain and polyurethane, and placed cardboard behind the lathe to catch the splatter.)

7 Using a parting tool, separate the candle holder from the faceplate as shown in the drawing *below*.



BUYING GUIDE

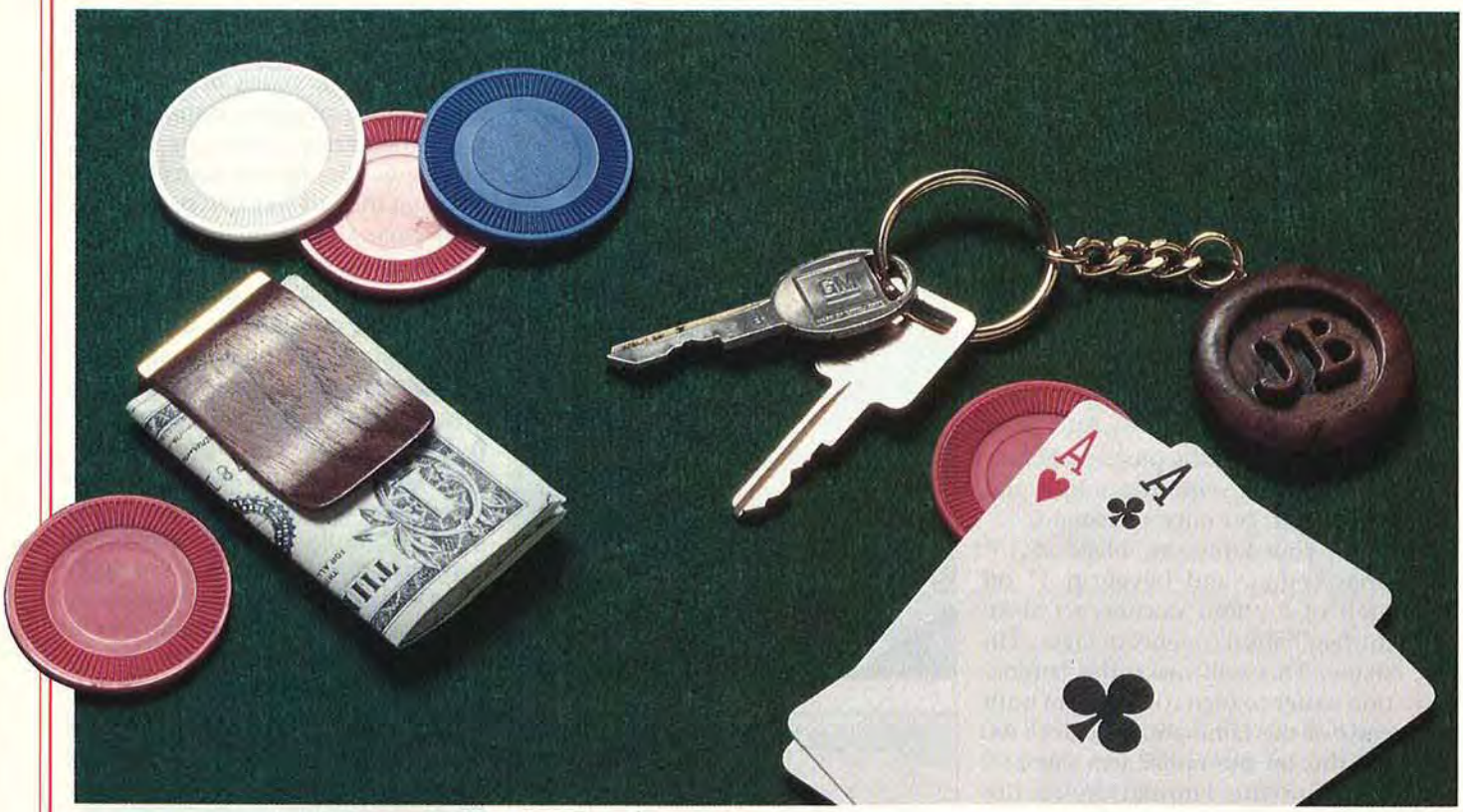
• **Glass Chimney.** Catalog no. PO101, minimum order 2 chimneys at $4.95 each, plus $3 shipping from Craft Supplies USA, 1287 East 1120 South, Provo, UT 84601, or call 801/373-0917.

Project Design: C.L. Gatzke
Photograph: William Hopkins
Illustrations: Bill Zaun; Jim Stevenson

Here's a Pair to Draw to:

Print this article

WALNUT MONEY CLIP AND



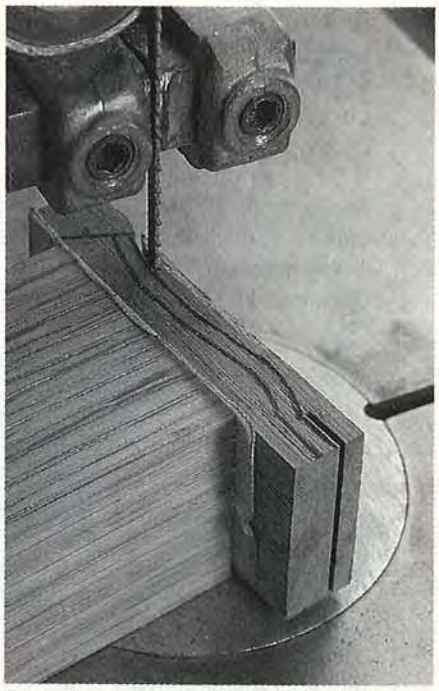
Unique gifts each, both of these handsome stocking stuffers also have a practical side. Best of all, the makings for these last-minute gifts are as close as your scrap bin.

MONEY CLIP

1 Cut two pieces of scrap ½" walnut to 1⅛x2⅛", one for the money clip front, the other for the clip back. Using the full-size pattern *below* and carbon paper, transfer the shape of the clip fronts' top onto the top edge of one of the walnut blocks. Set the other block aside for now.

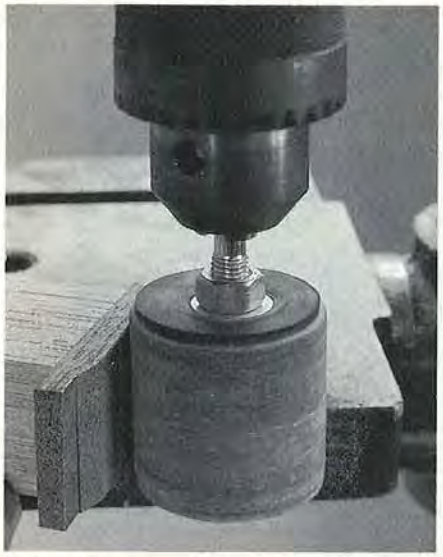
FULL-SIZE PATTERN (Top View)

2 With double-faced tape, stick the walnut block with the shape traced on it to the end of a piece of scrap (see the photo at *right*). Using the scrap as a handle, make a relief cut at the channel end; then cut in from the other end to form the face of the clip front.

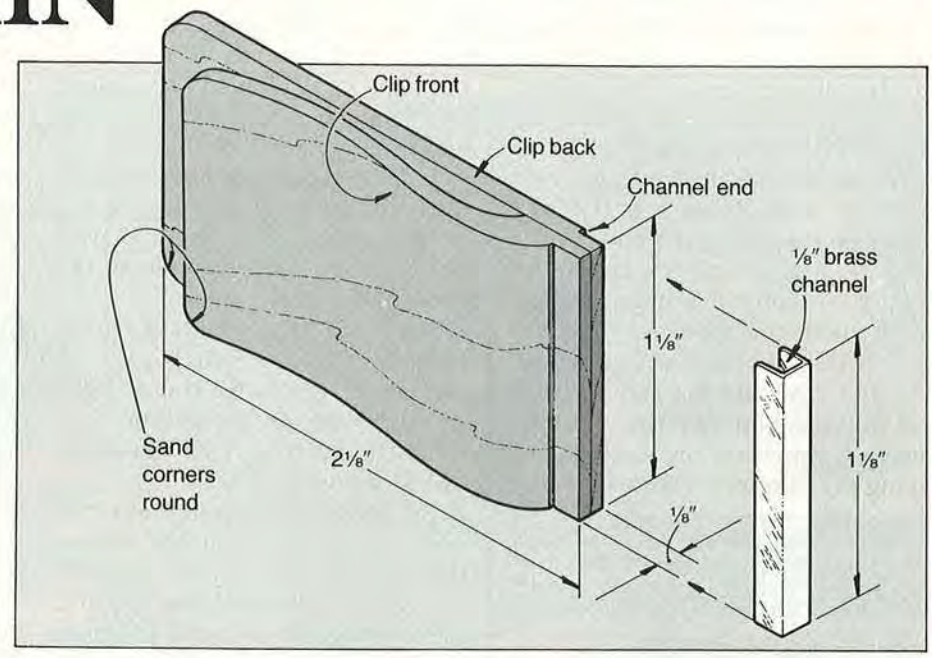


Use a band saw with a ⅛" blade to cut the clip front to shape. Make a relief cut at the channel end first.

KEY CHAIN



With a drum sander, smooth the clip front to shape following the front-face profile pencil mark.

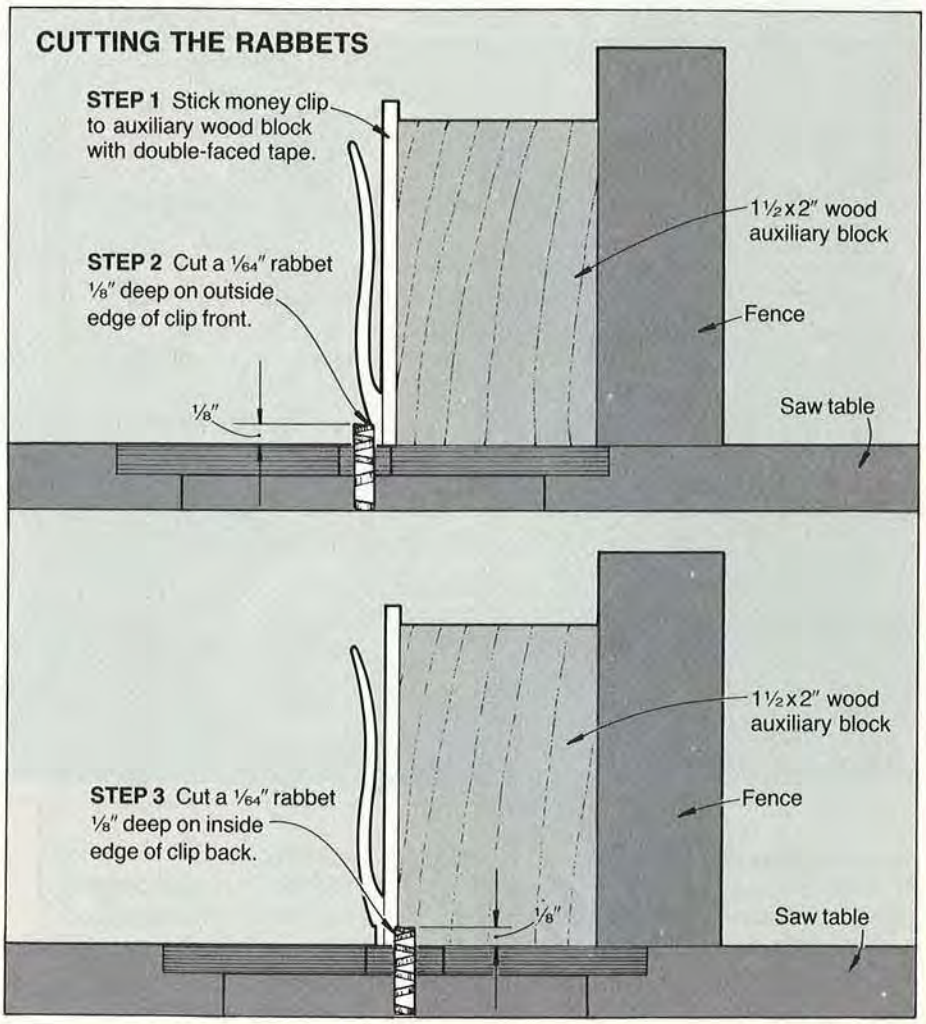


3 Mount a 1½"-diameter sanding drum to your drill press, and sand to the marked front-face profile line as shown in the photo *above*. Do not sand the end that fits into the brass channel.

4 Back at the band saw, make the second cut where marked to complete the clip front. Remove the waste material from the scrap holder; then tape the clip front, face side in, to the scrap. Sand the back side of the clip front. Remove the finished piece from the scrap.

5 Tape the other block to your scrap holder as you did the first one, and resaw a ⅛"-thick piece from it. Sand the cut surface until the piece is 1/16" thick. Round the front corners of both parts (see the Exploded-View Drawing). Then, epoxy the clip front to the back piece, making sure the top, bottom, and channel edges align.

6 Using the three-step drawing at *right* as a guide, rabbet the channel end of the clip to accept a ⅛" brass channel. Test-fit the channel end of the clip into a piece of ⅛" brass channel, cutting again if necessary to get a snug fit.


CUTTING THE RABBETS
STEP 1 Stick money clip to auxiliary wood block with double-faced tape.
1½x2" wood auxiliary block
STEP 2 Cut a 1/64" rabbet ⅛" deep on outside edge of clip front.
Fence
⅛"
Saw table
1½x2" wood auxiliary block
STEP 3 Cut a 1/64" rabbet ⅛" deep on inside edge of clip back.
Fence
⅛"
Saw table

Continued

WALNUT MONEY CLIP AND KEY CHAIN

7 Cut a piece of ⅛″ brass channel (available at most hobby stores) to 1¼″ long. Epoxy the brass channel to the rabbeted end of the walnut clip. After the epoxy has cured, file or sand the ends of the brass flush with the walnut. (Be careful power sanding. If the brass gets hot and heats up the epoxy, the epoxy may liquefy and the pieces can separate.) To shine the brass, buff it with 0000 steel wool.

8 Finish the money clip as desired. (We filled a can with an oil finish, submerged the clip into the oil, wiped off the excess, and hung the clip on a wire to dry.)

Supplies: double-faced tape, epoxy, ⅛″ brass channel, 0000 steel wool, oil finish

Project Design: Jim Boelling

KEY CHAIN

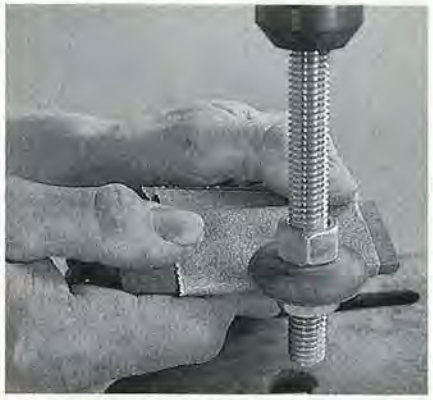
1 Plane or resaw a piece of scrap (we used walnut) to ¼″ thick, and cut it to 2x12″ long. (Use a piece this long for safety when cutting and drilling later.)

2 Using a compass, mark a 1½″-diameter circle at one end of the walnut board. Now, drill a 1″ hole ⅛″ deep into the walnut at the centerpoint of the circle.

3 Back the stock with scrap to prevent chip-out. Switch to a ½″ bit, center the bit in the 1″ hole, and drill through the walnut.

4 Band-saw the 1½″-diameter disk to rough shape.

5 As shown in the photo at *right,* use two nuts to fasten the walnut disk to a ½″ bolt. Chuck the bolt into your drill press, start the drill press (we used a speed of about 1,000 rpm), and sand a round-over on the top and bottom edges of the disk. (We used progressively finer grits of sandpaper wrapped around a scrap of wood to sand the disk to shape.) Remove the disk from the bolt.



Sanding the walnut disk to shape on a drill press.

6 To plug the hole in the disk, cut a ½″-diameter plug ¼″ thick from walnut. Glue the plug inside the ½″ hole flush with the bottom. Later, sand the plug flush.

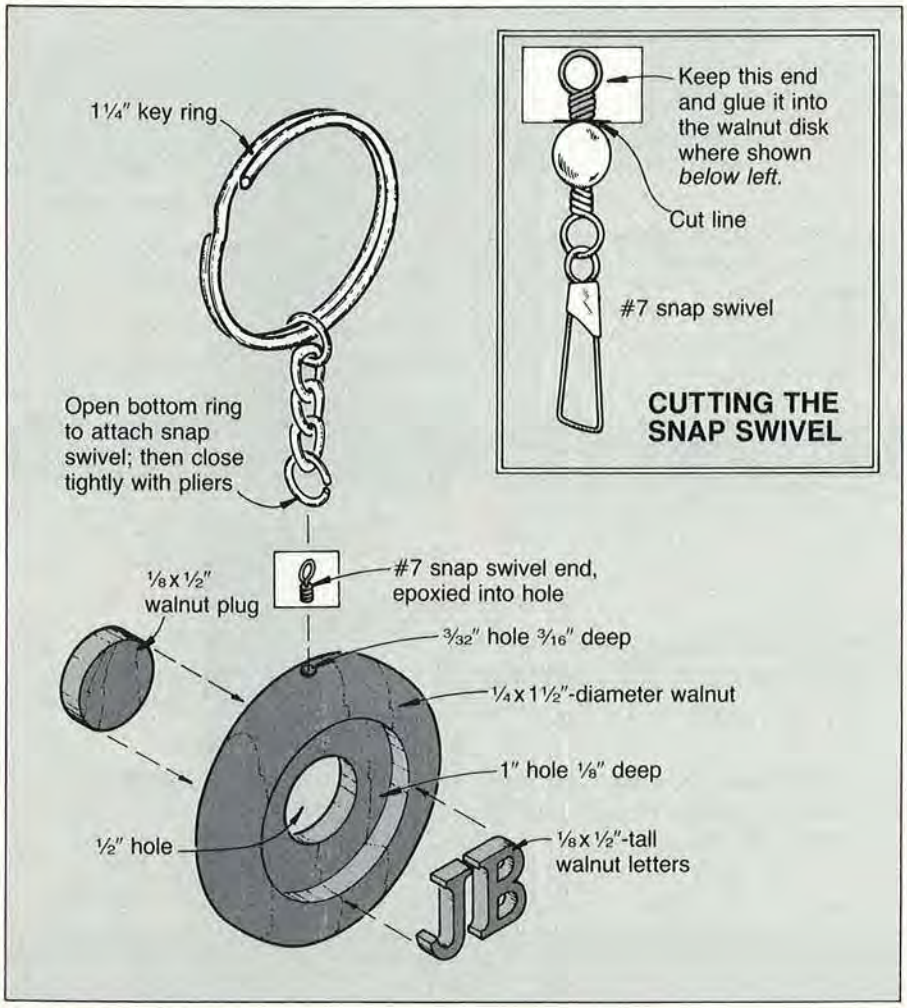
7 Glue or epoxy your initials inside the 1″ hole (see the Buying Guide for our source of letters).

8 Clamp the disk into a small handscrew, and drill a 3/32″ hole 3/16″ deep into the top.

9 Cut a #7 snap swivel (the kind used for fishing) in two where shown at *left.* Epoxy the swivel loop into the 3/32″ hole in the disk where shown in the Exploded-View Drawing.

10 Sand and apply the finish. Attach the ring and chain to the disk. (We used the chain and ring from another key chain.)

Supplies: epoxy, #7 snap swivel, 1¼″ key ring with chain, finish


1¼″ key ring
Open bottom ring to attach snap swivel; then close tightly with pliers
⅛x½″ walnut plug
#7 snap swivel end, epoxied into hole
3/32″ hole 3/16″ deep
¼x1½″-diameter walnut
1″ hole ⅛″ deep
½″ hole
⅛x½″-tall walnut letters
JB
Keep this end and glue it into the walnut disk where shown below left.
Cut line
#7 snap swivel
CUTTING THE SNAP SWIVEL

BUYING GUIDE

• **Walnut letters.** Two ⅛x½″ letters of your choice, $1.50. ppd from Academy Trophy, 3002 Forest Ave., Des Moines, IA 50311.

Project Design: James R. Downing
Photographs: Bill Hopkins
Illustrations: Kim Downing; Bill Zaun

"Talk of the Neighborhood"

Print this article

DOLL STROLLER

When the other kids on the block ask your special one what she got for Christmas, we bet she'll think of this gift first. It's decidedly stylish, so very practical, and best of all, it's from you.

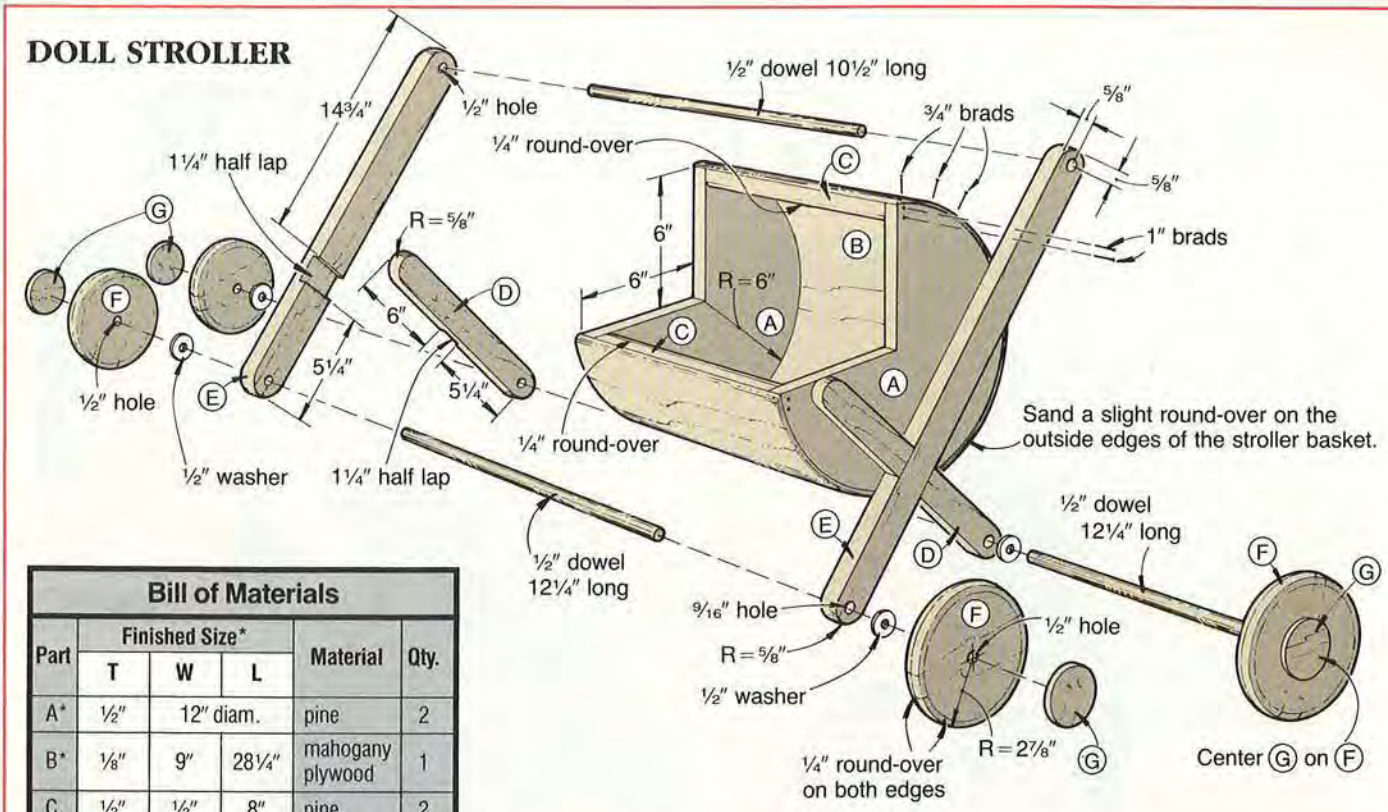
FIRST, BUILD THE STROLLER BODY

1 Cut and edge-join enough ½" pine stock to form two panels — each measuring 12½" square — for the stroller sides (A). Scrape off the excess glue, and use a straightedge to check each panel for flatness. Plane, if necessary.

2 Mark diagonals on one panel to find its center. Mark a 12"-diameter circle on the marked panel (we used trammel points to mark ours). With the marked panel on top, stick the two panels together using double-faced tape. Make sure the grain on both panels runs in the same direction.

Continued

DOLL STROLLER



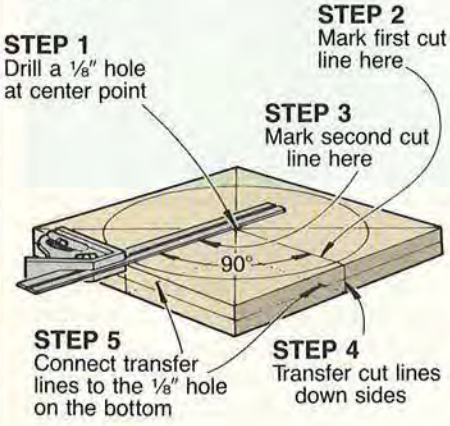
Bill of Materials

Part	Finished Size* T	W	L	Material	Qty.
A*	½"	12" diam.		pine	2
B*	⅛"	9"	28¼"	mahogany plywood	1
C	½"	½"	8"	pine	2
D	¾"	1¼"	12½"	pine	2
E	¾"	1¼"	21¼"	pine	2
F	¾"	5¾" diam.		pine	4
G	⅛"	2½" diam.		mahogany plywood	4

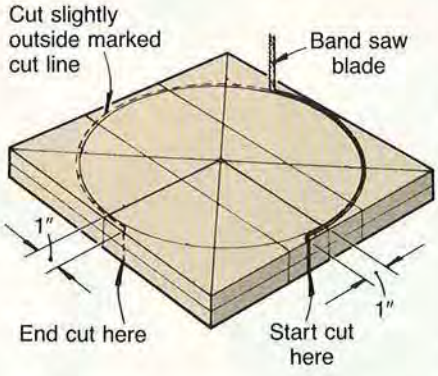
*Parts marked with an * are cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.

Supplies: double-faced tape, paraffin, 1½" dowel 10½" long for handle, 2—½" dowels 12¼" long for axles, 4 — ½" washers, ¾" brads, 1" brads, ½x5" machine bolt with two washers and nuts (for sanding arbor), putty, primer, paint (nontoxic)

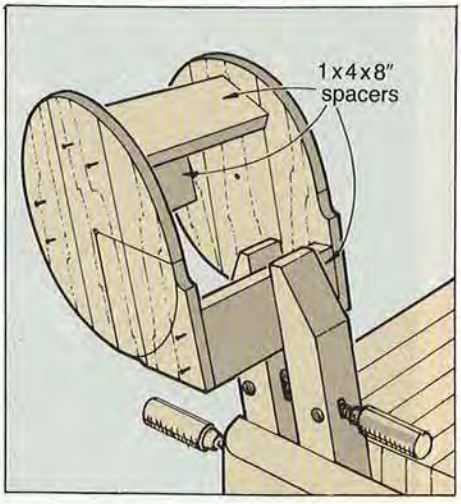
3 Mark the stroller-opening cut lines on the two panels, following the five steps outlined in the drawing *below.*



4 Using a band saw, cut the taped-together panels to shape, cutting just outside the marked radius and 1" past the 90° cut lines where shown in the drawing *below.* Cutting past the 90° cut lines creates notches to capture the plywood surround that you'll fasten to the sides later. Now, sand the panels to the marked radius for the finished shape. Pry the two panels apart, and remove the tape.



5 Cut three 8"-long spacers (we used 1x4s). Align the stroller sides by nailing the first spacer between the corners left square where shown on the following drawing. Now, nail the two remaining spacers between the stroller sides. Let the nail heads protrude; you'll remove the nails later. Clamp the assembly firmly to your workbench as shown in the drawing *below.*



6 From ⅛" mahogany plywood, rip and crosscut the plywood surround (B) to 9x30". Note that the grain runs crosswise.

7 To make wrapping the plywood around the sides easier, sponge the outside face of the plywood with warm water. Starting the plywood in the notches cut earlier with the band saw, wrap the plywood

around the stroller sides, gluing and nailing as you work as shown in photo A. (We attached a clamp to the free end of the plywood to help hold it down as we nailed it in place.) Let the glue dry. Later, remove the 1x4 spacers.

8 Using a fine-tooth handsaw, cut along the 90° cut lines to form the stroller body opening.

9 Cut the two rails (C) to size. Rout a ¼" round-over along one edge on both. Glue and clamp each rail in position between the stroller sides, flush against the plywood. Sand a slight round-over on the outside edges of the stroller basket.

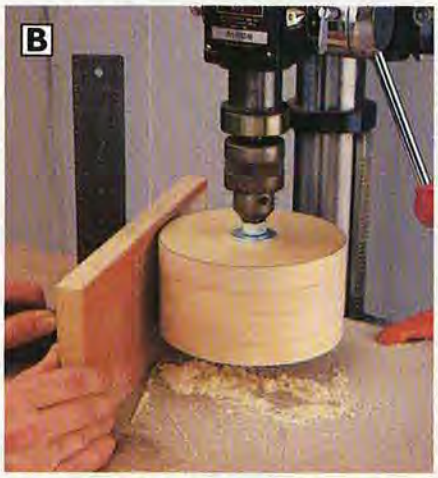
Moisten the plywood with warm water, start it in the cut notch, and then glue and nail it as you wrap it around the stroller sides.

NOW, FOR THE FRAME

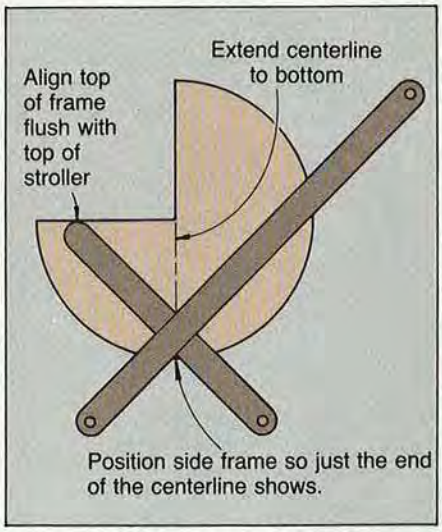
1 Cut the frame parts (D, E) to size. Refering to the Exploded-View Drawing at *left,* mark a 5/8" radius and hole locations on the ends of each piece. Then, mark the location of the half-lap joints on each frame part. Mount a dado blade to your table or radial arm saw, and cut a 1¼"-wide half lap in each piece where marked. Cut the radiused ends to shape.

2 Drill 9/16" holes for the axles and ½" holes for the handle in the frame parts. (We used double-faced tape to stick the pieces together, and then drilled the holes through both at one time.) Sand the frame parts smooth.

3 Glue each frame assembly together, checking for square.



Sand all four wheels round at the same time on the drill press.


Extend centerline to bottom
Align top of frame flush with top of stroller
Position side frame so just the end of the centerline shows.

THE AXLES AND WHEELS COME NEXT

1 Cut four 6"-square pieces from ¾" pine stock for the wheels. Draw diagonals to find center, and mark a 2⅞" radius on each. Cut the wheels to shape.

2 To true up the wheels, start by drilling a ½" hole through each at the marked center point. Fasten the four wheels on a ½x5" machine bolt with flat washers on the top and bottom as shown in photo B. Chuck this assembly to your drill press, and sand smooth. (We used a half-sheet of 60-grit sandpaper applied to particleboard with spray-on adhesive and held at 90° to the table with a try square. We positioned the drill press belt to run it at the slowest speed possible.)

3 Rout a ¼" round-over on both edges of each wheel (we routed ours with a table-mounted router).

4 To make the decorative hubcaps (G) mark four 1¼"-radius circles on ⅛" plywood. Cut the hubcaps to shape, and sand them smooth. Center and glue one of the hubcaps to each wheel.

5 Cut the push bar and two axles from ½" dowel stock. Use the dimensions given on the Exploded-View Drawing.

ASSEMBLY AND FINISHING

1 Glue and nail the side frames to the stroller body using the drawing *above* as a guide. Glue the push bar in position.

2 Fill any voids with putty and finish-sand the entire stroller. Apply a primer coat, then paint as desired.

3 Apply paraffin to the inside surface of all axle holes. Slide the axles through the holes, slip a washer on each axle end, then glue a wheel to the end of each axle.

Project Design: James R. Downing
Photographs: William Hopkins; Bob Calmer; Jim Kascoutas
Illustrations: Kim Downing; Bill Zaun

FLORAL WALL PLAQUES

We think you'll find it fun—and easy—to make these three-dimensional wall hangings. For more details about this nifty scroll saw technique, please turn to page 36.

1 Cut two workpiece blanks to 8¼" square from ¾" stock (we used Honduras mahogany). Cut or rout a ⅛" chamfer along all top outside edges on each.

2 Align the centerpoint, and transfer the full-size patterns (large photos) on this page and the next to the blanks, using carbon paper.

3 Drill a 1/16" start hole in each blank where shown on the photos. Using a scroll saw, cut the disk from within each blank. Then, cut the flower pattern from each disk. Sand

Print this article

Basswood plaques painted w

a slight round-over on the face of each of the flower pieces and on the inside edge of the outer frame. Now, sand the surfaces smooth.

4 To create the three-dimensional look, first lay the outer frame (good face down) on a flat surface. Lay three ¼"-thick spacers inside the round opening. Position the round disk (good face down) in the circle on the spacers, lining up the grain of the disk with that of the frame. Run a bead of woodworkers' glue around the perimeter of the disk and let dry. (We mixed a small amount of sawdust with the glue to prevent the glue from running between the cracks onto the plaque's face.)

5 Remove the spacers, and place the plaque good face down again. Now, position each flower piece in the opening from which it was cut. Apply a small bead of glue to the back side of each flower piece and to the disk.

6 Attach a sawtoothed hanger to the back of each plaque. Apply a clear finish of your choice.

Photographs: Bob Calmer

inned artist's acrylic paint.

"The Fairest of Them All"

Print this article

QUILT-LOOK HAND MIRROR

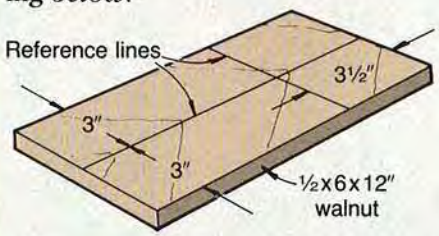
Once you grasp this finely crafted hand mirror, you'll know it's more than just another vanity accessory. The quilt pattern evokes a country-style. The smooth edges on the walnut frame almost beg to be touched. A builder of this treasured gift will not soon be forgotten.

First, assemble the decorative quilted insert; then trim it to fit into the rabbeted walnut mirror frame. There's no complicated joinery required.

READYING THE WALNUT FRAME

Note: *You'll need ½" stock for this project. You can either resaw or plane thicker stock to size.*

1 Cut a piece of ½" walnut to 6x12" long for the mirror frame. (We planed down a piece of ¾" stock.) Mark reference lines on the walnut where shown on the drawing *below.*



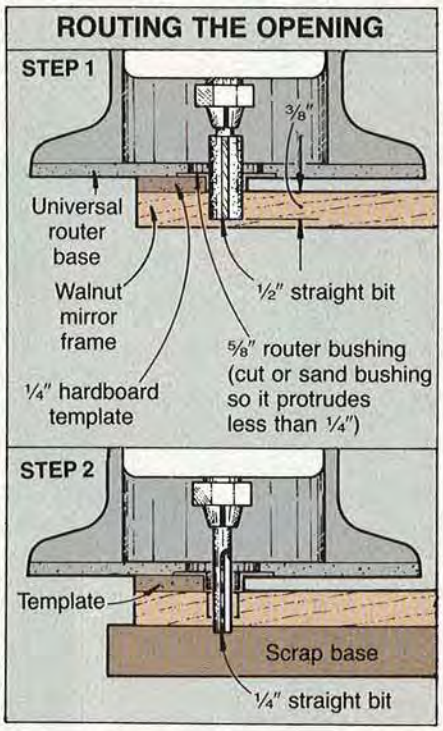
2 To make the template for routing the opening in the walnut, start by cutting a piece of ¼" hardboard to 6x8". Using carbon paper, center and transfer the router *template outline* (inside oval) and reference lines shown on the Full-Size Half Patterns to the hardboard.

3 Carefully cut and sand the hardboard template opening to shape.

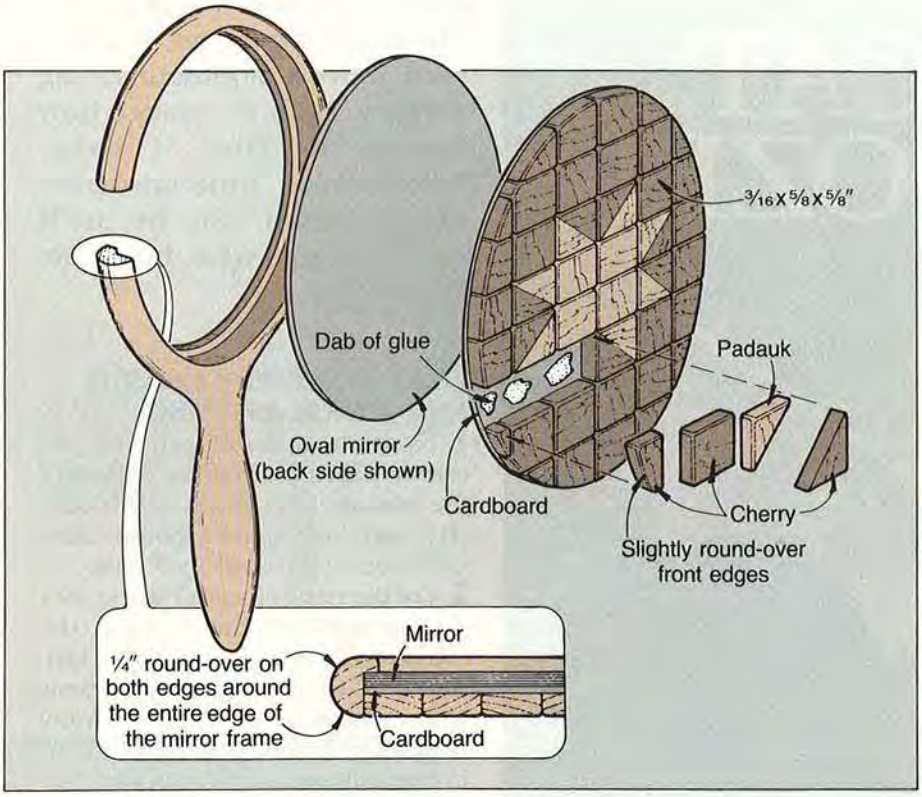
4 With double-faced tape, stick the template to the walnut, aligning the centerlines. Tape the walnut to a piece of scrap to avoid cutting into your workbench top when routing the opening.

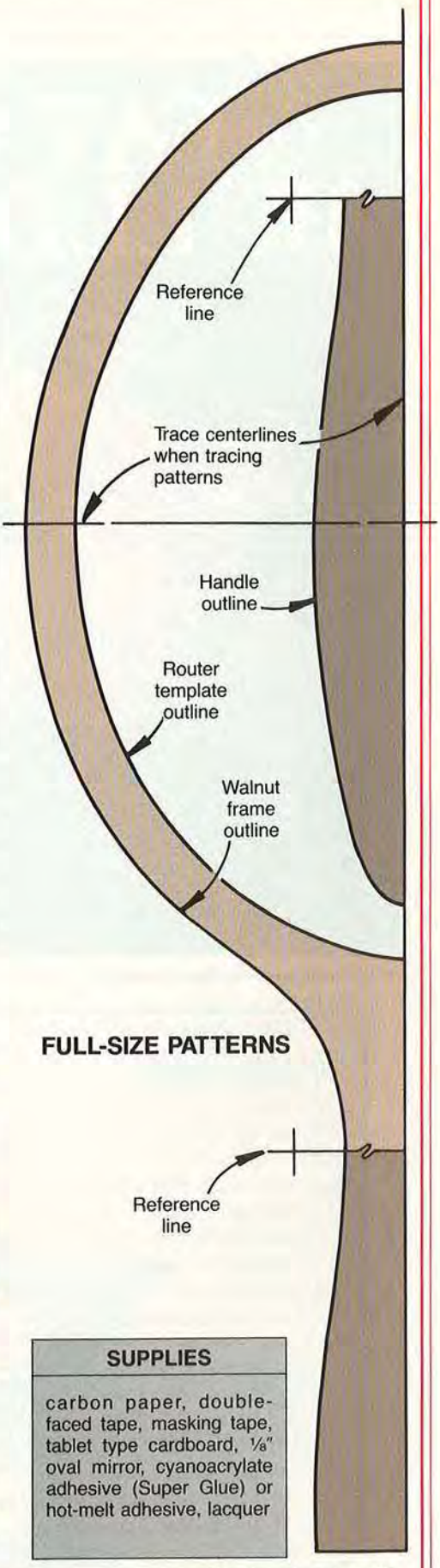
5 Fit your router with a ⅝" bushing and a ½" straight bit. (Our bushing was too long, so we cut it with a hacksaw so it protruded a fraction less than ¼" below the surface of the router base. (See the Buying Guide for our source of the router base and bushing.) With the bushing riding along the inside edge of the template, rout a ½" groove ⅜" deep in the walnut like that shown in Step 1 of Routing the Opening Drawings. (We made several shallow passes and gradually increased the depth being routed. Trying to rout ⅜" deep in one pass may break the straight bit.)

6 Switch to a ¼" straight bit. Riding the bushing against the inside edge of the template, rout completely through the walnut and into the scrap base as shown in Step 2. Separate the walnut from the scrap stock and template.



7 With carbon paper, trace the full-size patterns onto light cardboard. (Be sure to mark the reference lines so you can position the patterns correctly on the walnut.) Cut





FULL-SIZE PATTERNS

the cardboard patterns to shape. Tape the handle pattern piece to the frame pattern piece. Then, position the pattern on the walnut, align the reference lines with those on the walnut stock, and tape the pattern to the walnut. Now, using a band saw, cut the mirror frame to shape, remove the pattern, and then sand the cut edges smooth.

8 Chuck a ¼" round-over bit into your table-mounted router. Rout a round-over along all the *outside* edges of the walnut frame. Hand-sand the entire frame (we wrapped sandpaper around a piece of foam to sand the rounded edges).

LAYING-UP THE QUILTED INSERT

Note: *You assemble the quilted insert oversize, and then cut and sand it to shape to ensure a tight fit within the routed opening.*

1 Plane or resaw a 24" length of ¾" cherry and a 12" piece of ¾" padauk or another contrasting wood to ⅝" thick. Now, rip strips 3/16" wide (the lengths stated are extra long for safety when cutting).

2 Using a miter box, cut 20 cherry squares and 4 paduak squares (⅝ x ⅝"). With the remaining stock, miter-cut one end, and then cross-cut as shown in the photo *below* to form the 16 trianglar pieces for the starlike center.

3 Cut a piece of cardboard to 3¾ x 5" (we used the backing from a writing tablet). Draw a horizontal and vertical centerline on the cardboard. Select four pieces of padauk, and sand the top of each smooth. Then, sand a slight round-over on all four top edges of each square. Place a small dab of glue on the

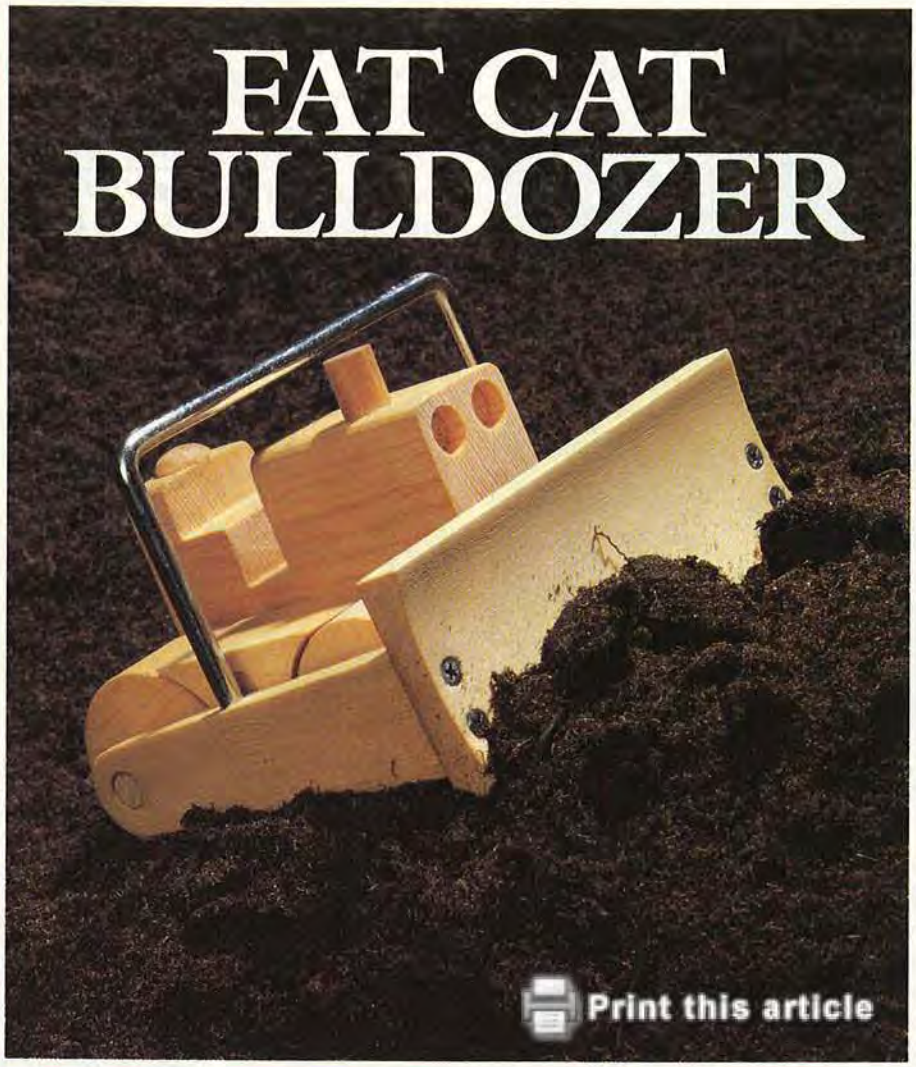
Cutting the triangular pieces to shape from the longer lengths.

SUPPLIES

carbon paper, double-faced tape, masking tape, tablet type cardboard, ⅛" oval mirror, cyanoacrylate adhesive (Super Glue) or hot-melt adhesive, lacquer

Continued on page 81

FAT CAT BULLDOZER



Every sandbox deserves a bulldozer that can build a road, move a mountain, or dig a valley. And, no matter how lost in the land of make-believe your little construction foreman may be, he'll never forget who built his favorite toy.

FIRST, MAKE THE CHASSIS AND TRACK ASSEMBLY

1 Using the full-size patterns and carbon paper, transfer the outline of the chassis (A), two track blocks (B), and hole center points onto 1½" stock. (We used 2x6 scrap.)

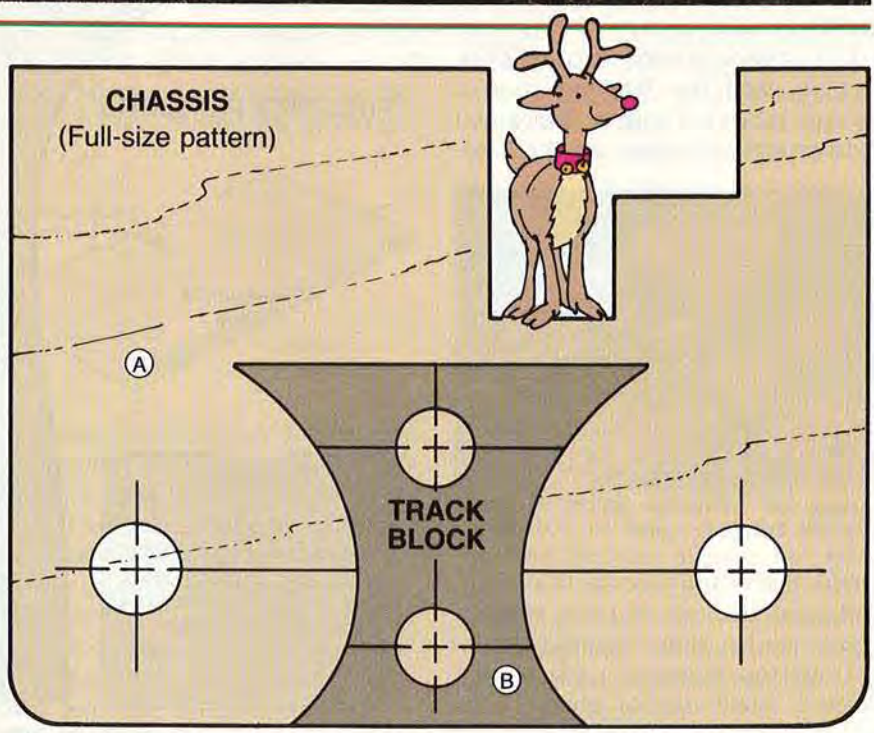
2 Cut the track blocks to shape with a band saw. Rip and crosscut the chassis to its final dimensions. Then, rout a ¼" round-over on the chassis where shown on the Exploded-View Drawing. Cut or dado the notches in the chassis, and drill the 7/16" axle holes you marked earlier.

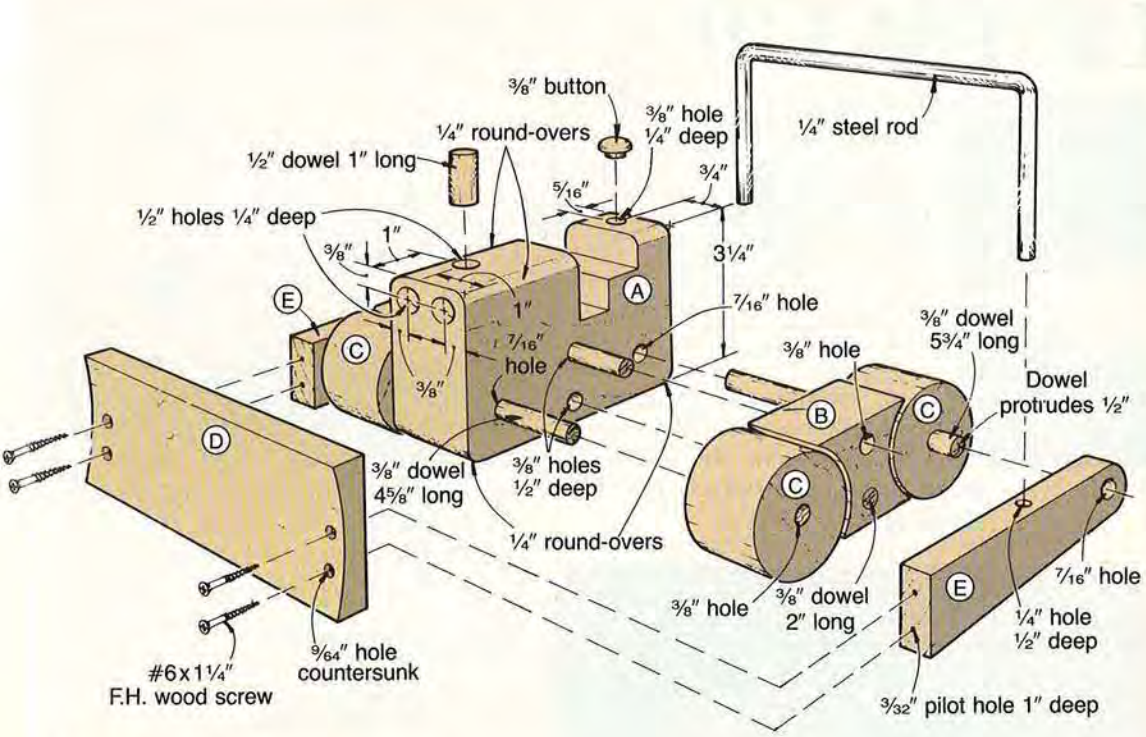
3 Lay out and drill the holes for the exhaust stack (½" dowel), gas cap (⅜" wood button), and headlights, using the hole sizes and locations given on the Exploded-View Drawing. You'll drill the holes in the track block later.

4 With a compass, mark four 2"-diameter wheels (C) on 1½" stock. (We used the same scrap stock used for the chassis and track blocks.) Drill a ⅜" hole (we used a brad point bit) at the center point of each marked wheel. Carefully cut and sand the four wheels to shape.

5 Cut the front and rear axles to length from ⅜" dowel stock. Glue one wheel onto each axle (the front axle fits flush with the outside face of the front wheels; the back axle protrudes ½" from the outside of each rear wheel).

6 With the chassis on its side (we clamped ours in a woodworker's vise), slide the wheel-axle assemblies into the axle holes. Finally, clamp one track block to the chassis centered between the two wheels, and drill a pair of ⅜" holes through the block and ½" into the





Bill of Materials					
Part	Finished Size*			Material	Qty.
	T	W	L		
A	1½"	3¼"	4¼"	pine	1
B	1½"	1¾"	2⅛"	pine	2
C	1½"	2" diam.		pine	4
D*	½"	2¼"	5¾"	pine	1
E	½"	1¼"	4¾"	pine	2

*Part marked with an * is cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.

Supplies: ½" dowel stock, double-faced tape, ⅜" dowel stock, ¼x13½" cadmium-plated steel rod (available at most hardware stores), 4 — #6x1" flathead wood screws, ⅜" wood button, epoxy, polyurethane or a nontoxic oil finish

chassis. Repeat this process to drill the holes for the other track block. Glue and dowel the track blocks to the dozer. Later, sand the dowels flush with the outside face of each track block.

7 Slide the axle assemblies through the chassis axle holes, and glue a wheel to the other end of each axle. (Be careful not to get the wheels too tight against the chassis. If you get them too tight, the wheels won't turn freely.)

HERE'S HOW TO SHAPE AND ATTACH THE DOZER BLADE

1 Cut a piece of ½" stock to 2¼x12" long for the blade (D).

2 To form the curved blade front, start by raising the table saw blade ⅛" above the surface of the saw table. Next, set your table saw miter gauge at 5[illegible] from center. Use this angled setting to position a straightedge (we used a 2x4) next to the blade where shown in the photo *below.* Clamp the straightedge in

Use the table saw and an angled fence to cove the dozer blade.

place. Start the saw and use push sticks to move the ½" board across the blade (pushing forward) to cut the cove. Next, raise the blade 5/16" above the saw table surface, and make another pass to deepen the cove. (We cut several pieces of scrap stock first to ensure the straightedge was in the right position to center the cove on the workpiece.) Now, crosscut the blade to finished length.

3 To make the blade arms (E), cut two pieces of ½" stock to 1¼x4¾". Using the full-size Blade Arm pattern *above,* transfer the shape of the blade arm and the 7/16" hole location to one of the ½" pieces. Using double-faced tape, stick the two pieces together, with the marked piece on top. Cut the taped-together pieces to shape, and drill a 7/16" hole through both pieces for the rear axle. Mark the location, and drill a ¼" hole in the top of each blade arm for the roll bar. Pry the pieces apart, and remove the double-faced tape.

4 Drill and countersink four holes through the dozer blade and into the

Continued on page 82

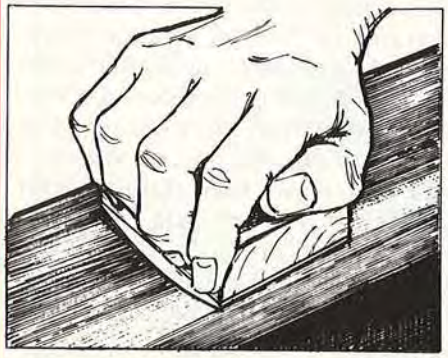
BUCKLE 'EM UP

What better way to show off your woodworking hobby than with our easy-to-make belt buckles? You can make enough of them in one evening to take care of your gift list for months to come. You'll find the hardware inexpensive and the wood as near as your scrap box. Print this article

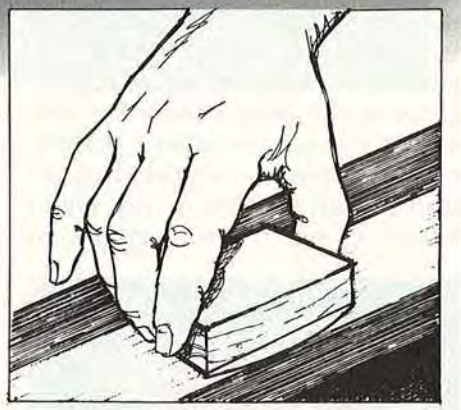
1 Resaw a piece of scrap stock to 5/16" thickness (we cut ours on the band saw). Cut blanks to 2x3" for the large buckles and 1⅝x2½" for the small buckles.

2 To protect your fingers when sanding, cut a 1"- to 1½"-thick block to the same size as the buckle. Using double-faced tape, stick the buckle blank to the block.

3 Sanding *across* the grain, sand the front of the buckle to a curved shape as shown *below*, being careful to maintain an even ⅛" thickness along the ends and a ¼"-thick middle.



Tape buckle blank to block and sand the curved profile.

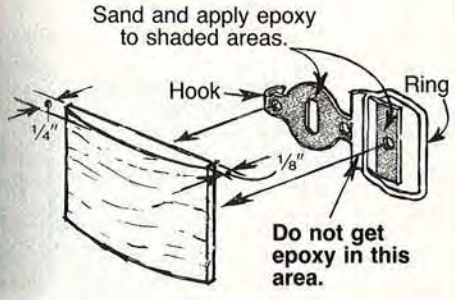


Smooth out curvature by sanding with the grain.

4 Now, sanding *with* the grain as shown *below*, sand the buckle smooth. Finish-sand the buckle by hand, using progressively finer-grit sandpaper.

5 Sand the back side of the hook hardware for better adhesion when epoxying the hook to the buckle. Epoxy the hook to the back of the buckle. Be careful not to epoxy the ring to the wood (we used quick-set epoxy).

BUCKLE ASSEMBLY



6 Finish as desired (we used spray-on Deft). Attach to your favorite belt.

BUYING GUIDE

• **Hook and rings.** For belts 1" to 1¼" use catalog no. 1601; for belts 1½" to 1¾" use no. 1602, 79 cents each. Write Tandy Leather, Advertising Dept., P.O. Box 791, Fort Worth, TX 76101 for the retail outlet nearest you.

Photographs: Bob Calmer
Illustrations: Chuck Stearns

QUILT-LOOK HAND MIRROR

Continued from page 77

back of each, and glue them in position at the center of the cardboard, alternating the grain as shown on the Exploded-View Drawing. (We used Super Glue; hot-melt adhesive also works.) Using the procedure just described, and working from the center out, glue the rest of the pieces in position on the cardboard to form your quilt insert.

4 Center the frame, rabbet side or front face down, over the quilted insert. Trace the rabbet outline onto the insert. Using a band saw, cut outside the marked line. Sand to the line until the insert fits snugly inside the rabbeted opening. Sand a slight round-over on the edges just cut.

FINAL ASSEMBLY AND FINISHING

1 Take the frame to a glass shop, and have a mirror cut to size. (See the Buying Guide for our source.) Place the mirror in the opening. Run a bead of glue along the edge of the mirror, and glue the quilted insert in place. To avoid damaging the silvering, be careful not to get glue on the mirror back other than at the outside edge.

2 Mask off the mirror, and apply finish to the walnut frame and quilted insert. (We used lacquer.)

BUYING GUIDE

- **Router guide bushing set.** Set has a universal router base plate that fits most popular round base routers. Also included are 5/16", 7/16", and 5/8"-diameter bushings. $11.95 ppd. from Woodcraft, 41 Atlantic Ave., P.O. Box 4000, Woburn, MA 01888, or call 617/935-5860.
- **Oval mirror.** $5.50 ppd. from The Stained Glass Store, 3617 Ingersoll Ave., Des Moines, IA 50312, or call 515/279-4855.

Project Design: Roberta Zahradka
Photographs: Bill Hopkins; Bob Calmer
Illustrations: Kim Downing; Bill Zaun

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"... does everything I want."
"A pleasure to use."
"Worth ever
"T

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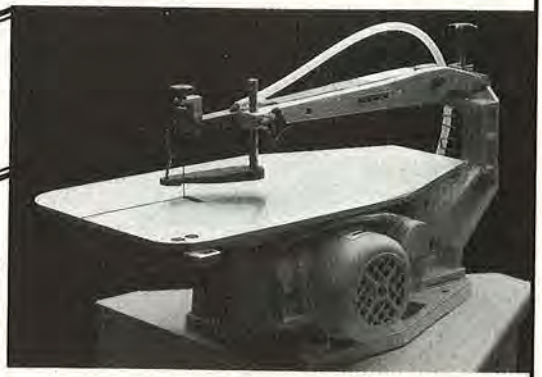

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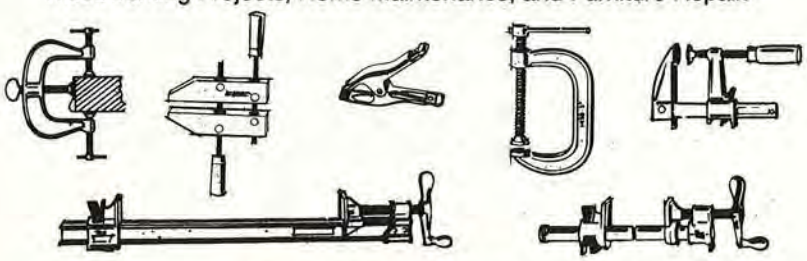

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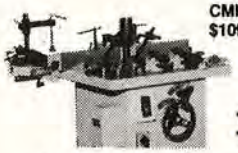

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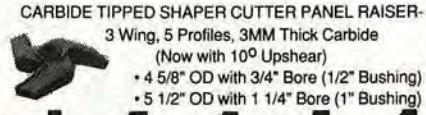

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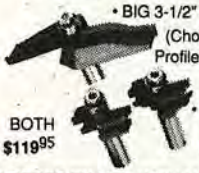

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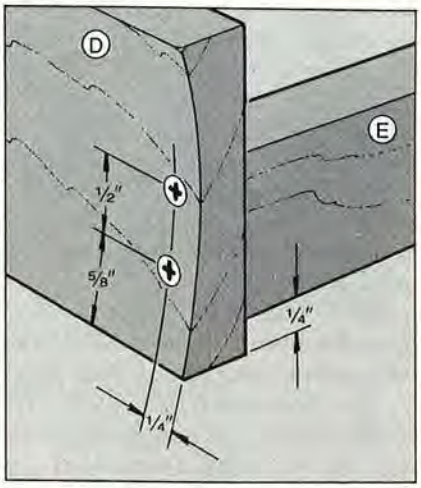
FAT CAT BULLDOZER

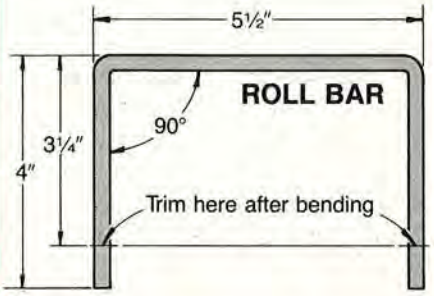
Continued from page 79

blade arm, using the dimensions and hole sizes on the drawing *below.* (The outside face of the blade arms are flush with the ends of the blade.) Slide the blade arms onto the rear axle dowel. Now, glue and screw the blade to the two blade arms.



FINALLY, FORM THE ROLL BAR AND FINISH THE DOZER

1 Cut a 13½" length of ¼" steel rod for the roll bar. Mark the locations of the bends with masking tape. Clamp one end of the rod in a vise, and make the bend where shown in the drawing *below.* Repeat for the other bend.



2 Trim the bottom ends of the roll bar even with a hack saw. Epoxy the roll bar into the holes in the blade arms.

3 Cut the exhaust stack to length. Glue the exhaust stack and ⅜" button in place on the chassis. Finally, apply two coats of polyurethane or several coats of an oil finish.

Project Design: James R. Downing
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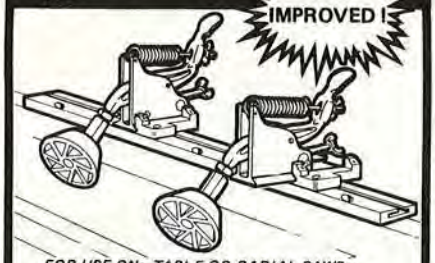

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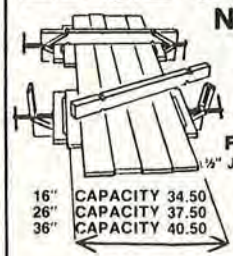

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You can't hurt workshop floors of concrete, but face it, they don't look hot. You can, however, brighten them up with one of these tough, easy-maintenance finishes that go steps beyond ordinary paint.

Have you always wanted to shape up your concrete workshop floor with a good-looking finish but postponed trying because it might not hold up? Well, get ready now. Here's some heavy-duty options you may want to check out.

Epoxy paint, the toughest of the tough

Polyamide epoxy gives you the toughest painted surface — as proof, it's used on loading docks. The standard color happens to be white. It really brightens a workshop floor, but colored pigment can be added at the store.

Epoxy ranks high in cleanability, durability, resistance to abrasion (such as walking across sawdust), chemicals, and moisture-related problems. But, compared with a latex floor enamel, you'll find epoxy a pain to apply. You have to mix two parts, then apply the mixture promptly, before it hardens (it sets up in about half an hour).

You'll need two gallons (about $40) for approximately every 250 square feet of floor. That translates to about 16 cents a square foot. And, pros suggest you sprinkle carborundum dust (available where you buy the epoxy) directly on the wet floor for slip resistance.

Acid-stain for permanence

In this virtually permanent coating method, a pigmented acid etches its way into the concrete. The color won't wear away until the concrete does, and you can protect it with floor wax. You can even have a fancy floor by scoring the concrete with a pattern.

Acid staining mimics an epoxy in characteristics, but ranks higher in durability. However, it may not be for you if your floor happens to already be sealed. Because of the acid, applying it requires a pro, who will charge you about 75 cents per square foot for the job.

Neither tough, easy-clean epoxy or acid-staining will do anything for your comfort, such as preventing tired feet. For that, your best bet will be to place mats around for cushioning in the areas you stand a lot. Called *anti-fatigue* mats, they're made of spongy vinyl about ⅜" thick.

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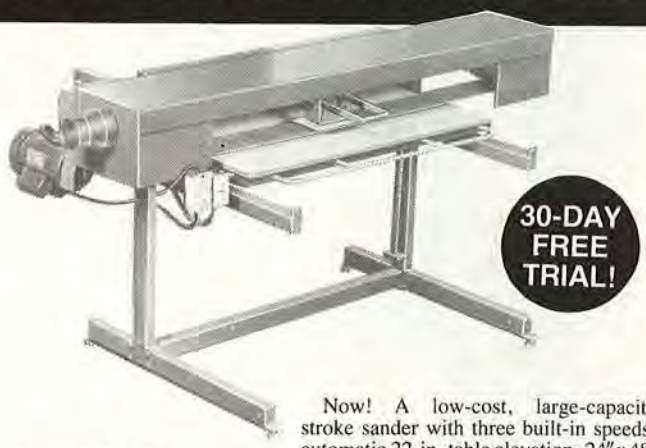

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☐ This Freud router bit set (stock #94-100) allows you to produce complete cabinet doors. ½" shank. Wooden storage case. List $248. On sale through December from most dealers at $199. FREUD, P.O. Box 7187, 218 Feld Ave., High Point, NC 27264; 1-800-334-4107 (in NC 919-434-3171).

☐ Buy three packs of 9 × 11 abrasive sheets and get the fourth one free. Your choice of garnet, aluminum oxide, silicon carbide, wet or dry or no-fill. If you need abrasives, we have them all. Call for belts any size, any grit. ECON-ABRASIVES, P.O. Box 865021, Plano, TX 75086-5021; 1-800-367-4101, in TX 214-377-9779.

☐ Schoolhouse Clock Kit. Ready to finish, preassembled solid pine cabinet with easily installed quality quartz pendulum movement and regulator window, 16½" high, 11" wide. Plus Free new fall catalog. Both $29.95 ppd. KLOCKIT, P.O. Box 629, Lake Geneva, WI 53147.

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☐ Build this 40" high Chicago Victorian Doll House from standard ¾" lumber. You get five huge 34" × 44" sheets of blueprints and patterns for 22 pieces of furniture. $17.99 ppd. MEISEL HARDWARE SPECIALTIES, P.O. Box 70, Mound, MN 55364.

☐ This complete Foredom package includes our most popular machine and a variety of the most useful accessories suitable for a full range of precision operations. ⅛ hp motor, foot control, 35 accessories. No. X0510 $237 value for only $187.70 ppd. CRAFTSMAN WOOD SERVICE CO., 1735 W. Cortland Ct., Addison, IL 60101.

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☐ Simply cut sandpaper from standard sheets for these sleeveless drum sanders. Holiday special: 1" × 3" and 2½" × 3" set, $27.95 + $2.50 s/h. Many other sizes available. Money-back guarantee. Send check to SINGLEY SPECIALTY CO. INC., P.O. Box 5087B, Greensboro, NC 27403.

☐ Tomegata Japanese Mitre Layout Tools. 45° tool has 3½" angled and 4⅜" straight edge lengths for precision cutting of 45° mitres $6.95. 45°/90° tool makes a more versatile and unusual gift for the woodworker at $9.95. Call toll-free 1-800-638-6405 for these and many other tool ideas. W.S. JENKS & SON, 1933 Montana Ave. NE, Washington, DC 20002.

☐ Delight any youngster with this rocking version of an extinct dinosaur. It's built entirely of solid lumber for years of hard play. The small size is ideal for 3 year olds and up. Plan #785 $5.95 + $1.50 p&h. Catalog $2 (refundable with first order.) THE WORKSHOP BLUEPRINT CO. P.O. Box 65725, West Des Moines, IA 50265.

☐ "Merle," the adjustable corner clamp, forces your project into square. Fully adjustable from 2⅝" × 2⅝" to 36" × 36". Perfect for anything that requires 90 degree corner clamping. Cast aluminum and steel construction; quick and easy to use. $18.95. MLCS LTD., P.O. Box 53-D, Rydal, PA 19046 or call toll-free 1-800-533-9298. (In PA 1-800-346-7511, ext. 56.) Visa/MC.

☐ The record bench plane set makes a perfect gift. Set includes the three most important planes you need: 04 smooth, 05 jack, and 07 jointer. Sale priced $139 ppd. XYLOPHILE, 138 E. Loundon, Lexington KY 40505; 1-800-354-9083.

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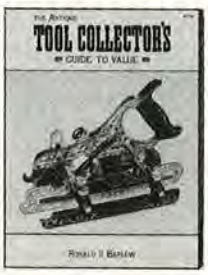
☐ Only $139.95 shipped complete, ready to run. Comparable value over $500. This versatile machine makes cutting intricate wood patterns easy. Thousands have been used in Europe for many years. PENN STATE INDUSTRIES-W, 2850 Comly Rd., Philadelphia, PA 19154; 215-676-7609, ext. 15.

☐ Radio-controlled model sailboat, the popular high-tech STAR Class Olympic Sailboat that traveled the world for over 75 yrs. Kit constructed of mahogany plywood frames and planking. 30" L, beam 8", spruce mast 44". Kit #1121 $105. Catalog $2. DUMAS PRODUCTS, 909 17th St., Dept. BHG, Tuscon, AZ 85719.

☐ For home craftsmen, the cast-iron constructed 15" Scroll Saw by Delta performs accurate detailing and cutting in woods, plastics and light gauge metals. Its "C" arm construction with 15" throat facilitates cutting large stock. A 17" × 7⅞" table tilts up to 45° for angle and bevel cuts. For information or the name of a nearby Delta dealer, call toll-free: DELTA INTERNATIONAL MACHINERY CORP., 800-438-2486. In PA, 1-800-438-2487.



☐ The Antique Tool Collector's Value Guide, 5,000 items described and priced: adzes, axes, braces, bitstocks, chisels, cobbler's tools, cooper's items, dividers, hammers, hatchets, knives, levels, planes, plumb bobs, rules, saws, shares, wrenches, and wheelwright's items. Over 2,000 illustrations. 230 pp. Now is the time to identify and price all of your old tools. $12.95 plus $1.05 postage. WINDMILL PUBLISHING, 2147 Windmill View Rd., Dept. W2-EL Cajon, CA 92020.

☐ The Total Shop multi-purpose tool. It's a 10" table saw, 34" lathe, 16½" drill press, horizontal boring machine and disc sander—5 tools in 1 quality machine. 1½ hp motor develops nearly 3 hp! Send for our 30-minute video demonstration tape (VHS or Beta). Include $20 refundable deposit. TOTAL SHOP, Dept. Q1, P.O. Box 16297, Greenville, SC 29606.

☐ Moisture-related problems such as shrinking, warping and cracking can ruin the most beautiful wooden pieces built. Avoid wood moisture problems by checking the wood with a moisture meter! The pocket-size Mini Ligno moisture meter is for the serious hobbyist and professional woodworker. For more information contact: LIGNOMAT, P.O. Box 30145, Portland OR 97230; 503-257-8957 or 1-800-227-2105.

☐ This all-new 12-piece, carbide, ½"-shank, general purpose router bit set comes packaged in a solid black walnut, American-made tool case. Descriptive labels show individual tool cut, specifications, and the individual stock numbers for handy re-ordering. A $345.39 value, yours for only $245.39. Contact Byrom for the distributor nearest you. BYROM INTERNATIONAL, P.O. Box 246, Chardon, OH 44024; 216-285-2341 or 1-800-722-5447, Ext. 28.

☐ This Woodworkers Log Book is a unique project organizer for every woodworker. A place to keep and find useful information. Over 50 pp of reference material on drill speeds, screw hole sizes, lumber density and shrinkage, adhesives, etc. Seven-ring cloth-covered binder $19.95 + $3.50 s/h. LEE VALLEY TOOLS LTD., 12 River St., Ogdensbergs, NY 13669.

☐ Square drive recessed screws give great grip and control with no stripping, no slipping. An assortment of zinc and brass plated #8 screws in ¾", 1", 1¼", and 1½" lengths. Organized in a durable plastic traymate, complete with 7½" hand driver and 2" power drive bit for use with an electric drill. $19.95 plus $2.50 s/h. THE WOODWORKERS' STORE, 21801 Industrial Blvd., Rogers, MN 55374.

☐ Router Master Mat is a specially-designed urethane pad that allows you to route small pieces without nailing or clamping. Perfect for routing door frames, plaques or any piece that is difficult to hold in place. Also useful for finish and belt sanding, glass cutting surface, kneeling pad, drawer lining to protect tool edges, etc. 2' × 3' mat No. WRM 23, $11.95 ppd. CONSTANTINES, 2054 C Eastchester Road, Bronx, NY 10461; 212-792-1699.

☐ With the purchase of the top-of-the-line 3950SP Dremel Moto-Tool® Kit, customers receive their choice of a free Dremel D-Vise™, Moto-Tool Holder or 25' Cord Reel. These gifts have values up to $24 and complement the versatility of the Moto-Tool. The kit includes a 40-piece accessory/bit assortment and handy carrying case. See your hardware/home center or hobby dealer.

☐ The world-renowned Martin Guitar Company sells wholesale and retail exotic woods (¼, ⅝, ¾,) and saw veneers (⅛" & ¼", Sanded Stock), plus guitar parts, kits, accessories and second quality guitars, SAWMILL/WOODWORKER'S DREAM, 1-800-247-6931, in PA 1-215-759-2837. Catalog and information upon request. The Martin Guitar Co., 510 Sycamore St., Nazareth PA 18064.

☐ This collection of 100 projects was prepared especially for children between 10 and 15. No special skill is required because full-size patterns are so complete one only has to follow the simple directions. Requires only common tools found around a home. $7 first class. MASTERCRAFT PLANS WEST, P.O. Box 625, Redmond, WA 98073.

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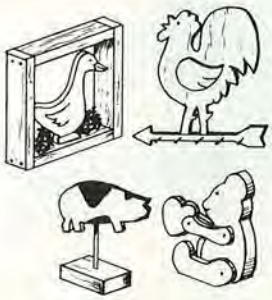
☐ Thin hardwood priced right. Clear, kiln-dried, two sides surfaced. 3″ to 10″ widths, 3′ to 6′ lengths. 20 sq. ft. packs, random widths and lengths. ½″ red oak $40 pkg.; ½″ walnut $48 pkg.; ½″ cherry $48 pkg.; ½″ pecan $32 pkg. ¼″ and ⅜″ also available. Prices include UPS delivery in continental U.S. Send check or MO with order. HARDWOODS OF ILLINOIS, RR4, Box 618, Mt. Vernon, IL 62864; 618-244-7221.

☐ Now you can lay out precise letters and numbers for your wood craft projects. Scrollsawers and sign carvers use these specially designed lettering layout guide sets. Quick and easy-to-use—simply trace around the letters—guides are very durable. Several styles and different sizes are available. Brochure $1. SEYCO SALES, 2107 S. Garland Ave., P.O. Box 472749, Garland, TX 75047.

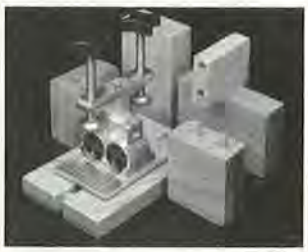
☐ Perfect edge-joining every time! Throw away your drill jigs and all other tools! New "Duo-Clamp" solves alignment problems, squeezes out excess glue, eliminates bowing. Made of sturdy maple. 16″ capacity $34.50, 26″ capacity $37.50, 36″ capacity $40.50 + $3 per clamp for s/h. Free information; phone 216-232-1281. MARK PRODUCTS, P.O. Box 46143, Bedford, OH 44146.

☐ If you enjoy woodworking, a versatile Marlin Wood Carving Machine may be just what you need. Three-dimensional carving of sculptures, plaques, panels and mouldings is easy. Wood sign carving is simple. Available in three sizes. $1 for complete catalog and price lists. MARLIN INDUSTRIES, INC., Route 70, Box 191, Cashiers, NC 28717; 704-743-5551.

☐ The Dupli-Carver is a wood duplicating machine that can reproduce three dimensional carvings in wood. The machine uses a stylus (tracer) to follow the contours of a statue or plaque, while a router carves a duplicate. Two models starting at $299. WOOD-MIZER®, 8180 W. 10th St., Dept. QQ19, Indianapolis, IN 46214; 317-271-1542.



☐ Over 50 folk art patterns! Create profitable "country cut" woodworking designs. This fun-filled packet contains over 50 full-size blueprint patterns PLUS hundreds of unique decorative projects. Enjoy this popular pattern packet plus woodworking brochure for only $7. ACCENTS IN PINE, Dept. CA 117, P.O. Box 7387, Gonic, NH 03867.



☐ This doweling jig is a significant advance in doweling because it is self-aligning, and automatically matches/aligns mirror-image holes to the second board. Patented design guarantees perfect dowel pin alignment. The Dowel Crafter, model G1662, regularly $49.95 now only $39.95 ppd. GRIZZLY IMPORTS, INC., P.O. Box 2069, Bellingham, WA 98227; 206-647-0801.

☐ Emperor's bracket clock is a pleasure to build. Our craftsmen carefully cut each miter, mortise and tenon for a perfect fit. The solid brass movement is completely assembled and warranteed for three years. The movement strikes the hour and plays the Westminster chimes. The case is solid ¾″ cherry sanded smooth and ready-to-assemble. For information write EMPEROR CLOCK COMPANY, Emperor Industrial Park, Dept. 2527, Fairhope, AL 36532.

☐ Carving tool kit: Give dad a quality Warren Tool Kit #KBL3-W. Includes a walnut and brass interchangeable handle and three high carbon steel blades honed ready for use. Send $20.40 ppd. for the kit or $1 for a catalog and let dad choose from over 500 items; money-back guarantee. WARREN TOOL CO., INC., Rt. 1, Box 14-A, Rhinebeck, NY 12572; UPS/COD call 914-876-7817.

☐ Sand like a professional, quickly and beautifully. The B-12 brush head (top) sands mouldings and intricate carvings without losing detail or shape of the part. Model # DD-63 (bottom) gives quick and excellent results on contoured-shaped parts. Both industrial quality. SAND-RITE MANUFACTURING CO., 321 N. Justine St., Chicago, IL 60607; 312-997-2200.

☐ Personalize your wood items quickly and easily with this brass branding iron. First line: HAND CRAFTED BY; second line: your choice of up to 20 characters including spaces. Compact size. $24 ppd. Guaranteed. Order toll-free 1-800-826-7606 (NE residents call 402-464-0511) or by mail from NOVA TOOL CO., P.O. Box 29341, Dept. BGL, Lincoln, NE 68529. Shipped within 1 week.

☐ Executive wood toys! Now you can create this 1929 Ford showpiece and many others like it from our detailed and easy-to-read patterns. We offer you a complete line of patterns, parts and wheels. Make this holiday season a time to remember with one of our executive wood toys! Send $1 for catalog to: TOYS AND JOYS, Box 628 GL, Lynden, WA 98264.

☐ Level surfaces when gluing stock together using Double Bar Clamps exclusively from Shopsmith. Eliminate workpiece bowing with pressure applied to sides, top and bottom. Three sizes: 24" (555162), 36" (555163), 48" (555164). SHOPSMITH, INC., Dept. 3733, 3931 Image Dr., Dayton, OH 45414-2591; 1-800-543-7586.

☐ Dustking industrial duty dust collection systems feature cast aluminum blower wheels and housings for spark-resistance, durability, and quiet operation. All units (½-2hp) have 5-year warranties. DUSTKING, BEC Industries, 51 Washington St., Sunman, IN 47041; 812-637-5784.

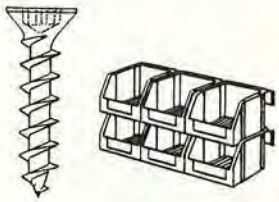
☐ Drum sander attachment converts any radial arm saw to a surface thickness sander for finish sanding up to 44" wide; can be attached to standard stand kit. Hardware kit available. Allows precise dimensioning of boards and parallel edge jointing. PERFORMAX PRODUCTS INC., 17065 Judicial Rd., Dept. WX, Lakeville, MN 55044. Call 1-800-334-4910; in MN 1-612-435-6780.

☐ Serious craftsmen know it takes quality tools to do quality work. We have led the way in quality woodworking machinery since 1921. Our Powermatic Model 66 Powerstars II TA Saw is holiday priced at $1499 and includes the Biesemeyer Model 50 fence. Call 615-473-5551 for the distributor nearest you. POWERMATIC, Morrison Rd., McMinnville, TN 37110.

☐ Ryobi's top of the line Cordless Driver/Drill 9.6 Volts. 2-speed with clutch, mechanical gear reduction and speed control. Only $99. You can pay more, but you can't buy better! THE SOURCE, 7305 Boudinot Drive, Springfield, VA 22150. Call 1-800-452-9999, in VA 1-800-468-1778. Send $3 for the most complete catalog of fine hand tools and cabinet-maker supplies.

☐ Cut the most intricate patterns in wood, plastics, light metals, etc. Just add your own ¼ hp electric motor to an Excalibur II, and start cutting! $495 US. Includes 72 blades, wrenches, and manual. Try it for 30 days. You must be satisfied, or purchase price refunded. In the U.S., call toll-free 1-800-387-9789, in Canada call collect 416-293-8624. J. PHILIP HUMFREY INTERNATIONAL, 3241 Kennedy Road, Unit 7 Scarborough, Ontario, M1V2J9.

☐ Square It™, recommended by Wood Magazine and Fine Woodworking Magazine as "revolutionary, highly accurate and practical" lights up when tool is square, assuring perfect 90° or 45° setting on any stationary tool. Comes ready to use with batteries, bulb, manual. 1-year guarantee $49.95. To order call 1-800-441-0101 or 1-212-645-9494. ZAC PRODUCTS INC., 34 Renwick St., New York, NY 10013.



☐ The perfect Holiday gift; special square drive assortments include 100 screws in each of six popular lengths, a hand driver, hex driver for use in a standard drill chuck and a set of six heavy-duty storage bins. #6 assortment: $17.35; #8 assortment: $20.95; #10 assortment: $27.90. MCFEELY HARDWOODS, P.O. Box 3, 712 12th St., Lynchburg, VA 24505; 1-800-443-7937, in VA 1-800-542-2023.

☐ Receive *The Mallet* magazine each month for one year, a membership card for museum admissions, purchasing, exhibiting and publishing benefits PLUS *The Wedge Head* by Kent Bailey. Send your check or money order for $15 to: NATIONAL CARVERS MUSEUM, 14960 Woodcarver Rd., Monument, CO 80132, or use Visa or MC by calling 303-481-4737. This offer expires Sept. 30, 1988.

☐ The Sand-Ease pneumatic Sander's sand-on-air drums contour to your work, smoothing curves and rounding edges quickly. Available with or without motor and in single and double shafted models. $279.95 to $529.95. Free Decoy & Woodcarvers Wishbook Catalog, P.C. ENGLISH, INC., P.O. Box 380, Thornburg, VA 22565; 1-800-221-9474.

☐ Build this exact duplicate of an original Victorian piano stool from a kit! Smoothly sanded solid maple parts, cast-iron claw feet. Approximately 26 inches high. Some woodworking tools and skills required. Instructions/free catalog with order. $69.95 ppd. Order #S752. 1-800-843-3320. VAN DYKE'S, Dept. D55, Woonsocket, SD 57385.

☐ Delta's new 15" scroll saw offers high performance in a small package. 1.6 amp, 115V motor, blade moves at 1,725 strokes per min. Uses standard 5" blade, with stroke of ⅞" and thickness capacity of 2". Table tilts 45° left. No. 40-150, value $165, yours for only $139.95. WOODWORKER'S SUPPLY OF NEW MEXICO, 5604 Alameda Place, N.E., Albuquerque, NM 87113; 505-821-0500.

☐ Minuteman's Mini-Flo furniture stripping system strips clean, fast, safely. Small budget & space requirements. Great way to start small business. 3′ × 5′ flow-on stripping booth works with New Minuteman Recirculating Flowover System to collect, filter and recirculate industrial strength stripper. Complete System just $988. MINUTEMAN, INC., Dept. 17G, 117 N. Monroe St., Waterloo, WI 53594. Catalog $2; free workshop demonstrates all Minuteman techniques and equipment.

☐ Bandsaw owners! A new tool is now available that enables craftsmen to make or repair any length band saw blade in minutes! Our splicer is available in two models: 1C-001 for ¼″ to ¾″ blades and 1C-002 for ⅛″ to ⅜″ blades each $49.95 ppd. The tool comes complete with detailed instructions and supplies for approximately 100 splices. NEW MILFORD SPECIALTIES CO., Dept. BHG, 24A South Main St., New Milford, CT 06776; 203-426-4276.

☐ If you value your fingers, you need a RIPSTRATE®. It holds the work tight against the fence with no hands near the blade. Makes perfect, straight cuts. Wheels lock to prevent kickbacks. Rquires no adjustment for stock width or thickness. Over 15,000 now in use. One-year guarantee, 30-day money back trial. $69 prepaid. Check, M.O., Visa or MC. Free brochure. FISHER HILL PRODUCTS, 4 Fisher Hill, Fitzwilliam, NH 03447; 1-800-421-0256.

☐ Personalize your finished projects with BrandMark's solid brass, torch-heated branding iron. Easy to use, lasts for years, satisfaction guaranteed. Makes an ideal gift. Custom irons available. Standard "Handcrafted By" and your name (18 letters) $24 plus $2.50 s/h. Check, Visa and MC accepted. Order from BRANDMARK by F&K, Dept. W, 462 Carthage Dr., Beavercreek, OH 45385; 1-800-323-2570 or 513-426-6843.

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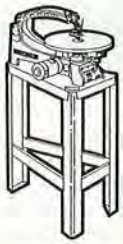
☐ One-of-a-kind bear and pig puzzles from standard dimension lumber. Approximate size 12″L × 4″W × 7″H. Plans $12.95 each include full-size assembly drawing, construction, finishing tips. Holiday Special: $19.95 both sets. First Class add $1.50. Illinois residents add 7% tax. Send check or M.O. to PKR CORPORATION, P.O. Box 2821, Glen Ellyn, IL 60138.

☐ Our Woodworker's Logbook offers a wealth of information on tools, hardware and supplies with an indexed project section to record data on various projects as you build. Tabular material includes lumber and plywood standards, screw sizes, bit speeds. The cloth covered binder is 2½″ thick and opens flat. $22.95 ppd. from GARRETT WADE, 161 6th Ave. New York, NY 10013; 1-800-221-2942.

☐ "Supergrit" quality sandpaper belts, discs, and sheets by mail order at warehouse prices. Small and medium-sized buyers can purchase small quantities of abrasives at industry prices ($25 minimum). Prompt, free UPS shipment to most USA areas. RED HILL CORPORATION, P.O. Box 500, Biglerville, PA 17307; 1-800-822-4003 or 215-925-5406 for free catalog.

☐ Craft your own wedged rabbet plane with this bronze shoulder plane kit. It's a perfect gift-project for woodworkers and tool buffs alike. Includes cast manganese-bronze body, rosewood infill blank, brass pins, ½″ blade and detailed instructions. Finished replica ½″W × 1⅝″H × 5¼″ L. Only $39 ppd. from WOODCRAFT SUPPLY CORP., Box 4000, Woburn, MA 01888; 1-800-225-1153.

☐ An ideal gift for kids. Now available in a complete kit. Upper components are all hardwood (ash), redwood base, steel bucket. Kit includes: hardware, fasteners, pre-cut and drilled wood and illustrated instructions for easy finishing and assembly. $64 delivered. BALLART DESIGN, 4606 S. 600 East, Salt Lake City, UT 84107; 801-261-4444 for UPS, COD orders.



☐ Holiday special for you. Delta's 18″ electronic variable speed scroll saw. Lets you dial the exact speed you need. 2″ thick capacity. Includes steel stand, solid state 115v motor and 96 assorted blades. List $1117.00 Sale $699.00 fob. HILLER HARDWARE, 1411 Assembly St., P.O. Box 1762 Columbia, SC 29202. Call 803-779-3131. Major credit cards accepted.

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☐ 1988 Woodworkers' Calendar features color photos and original catalog sheets of antique radial arm saws, electric routers, early combination machines, hand tools, etc. New machinery and craft show dates, first aid chart. Satisfaction guaranteed or money back. Send $9.75 + 1 s/h to WOODMACHINE COMPANY, Rt. 2, Box 227A, Mebane, NC 27302.

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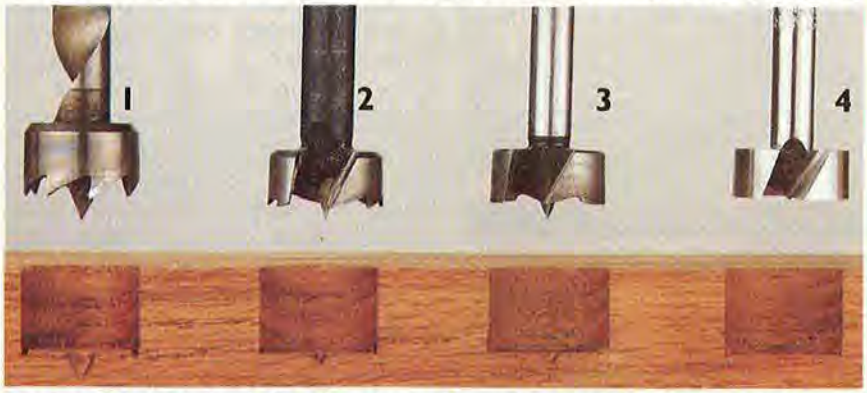
FORSTNER BITS A CENTURY OLD AND GOING STRONG



Forstner bits and the holes they bore. From left to right: (1) American-made multispur from Forest City Tool, (2) European multispur manufactured in Austria, (3) European Forstner sold by Freud, and (4) American Forstner manufactured by Convalco.

Along about 1981, imported Forstner-type bits began flooding the American market. And with all the promotion, these "new" bits caught the attention of a lot of woodworkers. Many didn't realize these hardworking bits had been around for a long time. An American gunsmith, Benjamin Forstner, patented the "Flange Bit" more than 100 years ago in Salem, Oregon.

A while back, we heard from Dr. Michael Kasha, a chemical physicist at Florida State University. Dr. Kasha was responding to a June, 1986 article in *WOOD* ("Power Drill Bits and Boring Tools"), in which we said that the rim of the Forstner bit does the cutting. "Wrong," says Kasha: "The rim only scores the diameter, the flat surface actually does the cutting. That's why the original Forstner bit (shown *far right*), is the only bit of its type that doesn't have a center spur."

Have the imports improved on Forstner's design?

To find out how the Forstner-type bits stack up against the real thing, we tested four of them and here's what we found.

An American-made multispur bit ($18.50), pictured number 1, produced a concave-bottom hole with a deep center pit and deep perimeter groove.

A European multispur bit ($17.50), number 2, produced a shallow perimeter groove and a noticeable center pit.

The European Forstner ($13.34), number 3, eliminated the perimeter groove but still has a center pit.

The American-made Forstner ($22.06), number 4, produced the smoothest bottom and eliminated the center pit.

Avoid excess heat

No matter which Forstner-type bits used, you'll encounter rapid heat buildup when using them with power tools. This causes the bits to become dull and burn the wood. To avoid excessive heat, do not run the bits faster than recommended in the speed chart *below*. The center spur does nothing to speed the cutting nor does it improve heat dissipation.

SOFTWOOD (PINE)	
Bit diameter	**Maximum RPM**
3/8 - 5/8"	2,400
11/16 - 1"	1,800
1 1/16 - 1 7/16"	1,200
1 1/2 - 3"	600
HARDWOOD (MAPLE)	
Bit diameter	**Maximum RPM**
3/8 - 5/8"	1,800
11/16 - 1"	1,400
1 1/16 - 1 7/16"	900
1 1/2 - 2 1/8"	450
2 1/4 - 3"	250

Continued on page 96

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☐ 4" x 21¾"	$17.75/doz.
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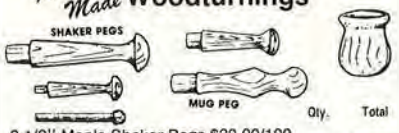

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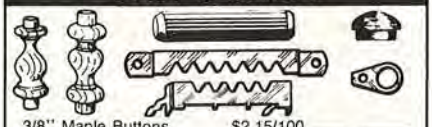

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SHOP SENSE

FORSTNER BITS

Continued from page 95

Are Forstner bits worth the price?

Forstner bits command higher prices than spade bits or adjustable bits. They also perform several wood-boring tasks better than any other bit on the market. For example, they allow you to:

1. Bore holes in thin stock without fear of breakthrough. Holes in ¼" stock are possible with the American Forstner bits.

2. Bore partial holes at the edge of a board. It worked just fine in our test, but don't try that with a spade or multispur bit.

3. Bore overlapping holes without sideways motion. Multispur bits also perform this operation, but the holes made by Forstner bits still look cleaner.

4. Create flat-bottomed depressions. Without a spur penetrating the wood, you get flat depressions — great for creating shallow bowls or trays.

5. Bore end grain without fear of the bit wandering with the grain.

6. Bore deep holes by frequently clearing shavings. Although some literature claims Forstner bits can't drill deep holes, the long shafts of American-made Forstner avoid this restriction.

7. Bore holes at any angle to the surface. You're liable to ruin a lot of stock if you try this with a multispur or spade bit.

A century has passed, yet the American-made Forstner bit hasn't deviated from the original design. The Connecticut Valley Manufacturing Company (CONVALCO) continues to machine the bit to the inventor's specifications. You can easily order Forstner-style bits imported from Europe or Taiwan from many mail-order catalogs. But you'll have to search for the American-made Forstners. For the name of a supplier in your area, contact CONVALCO, 102 Washington St., New Britain, CT 06050, or call 203/223-0076.

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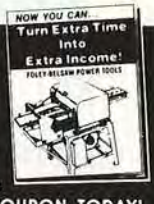

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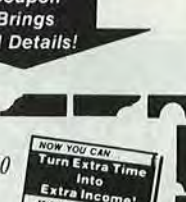

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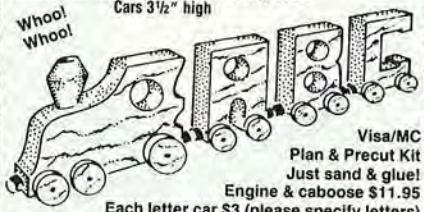

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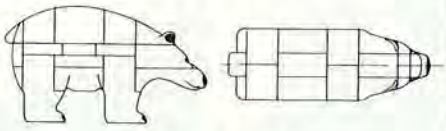

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Continued on page 101

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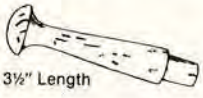

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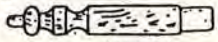

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SHOP SENSE

Continued from page 99

Hold the file at a 35° angle to the length of the bar and 90° to the bar's vertical plane, *below*. Keep about 1/10th of the file visible above the top of the cutter. A filing guide that clamps to your file, available from chain-saw dealers, makes accuracy easier.

Hold the file at 35° and perpendicular to the bar. File toward the tip.

Stroke toward the bar tip, from the inside of the cutter to the sharp edge. Avoid filing too deeply or you'll hit the chain's tie straps and put excessive hook in the cutter. Damaged tie straps lead to chain breakage. Extra hook weakens cutters.

Count the number of file strokes it takes to produce a clean, sharp cutter (less than 10 will usually do). Then, file each cutter the same number of strokes. This keeps cutter wear even and the chain running smoothly. File all the cutters on one side of the chain, then switch hands and file the other side. If you file cutters correctly, you'll see where you started.

Most people find filing one side of the chain easier than the other side because of right- or left-hand dominance. With practice, you'll be able to file with either hand equally well. In the meantime, take care to keep the angles the same.

RAKERS NEED ATTENTION, TOO

After a chain has been filed three or four times, check the height of the rakers with a raker gauge, also available from your dealer. Raker heights must be filed proportionate to cutter height because they govern the cutter's depth of bite.

Continued on page 102

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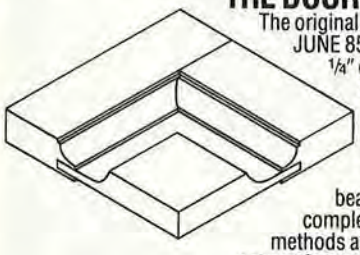

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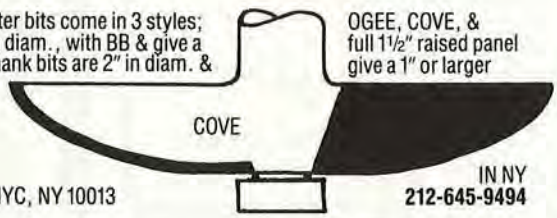

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SHOP SENSE

Continued from page 101

Most saw chain manufacturers recommend a raker height of .025" below the top of the cutter. Hold the gauge on the top of the cutter, as shown *below*, and, using a flat file, remove that part of the raker sticking above the gauge. Then, file a slope on the leading edge of each raker. This practice allows them to attack the wood smoothly.

***Note:** Don't attempt to file rakers without a gauge. Unevenly filed rakers cause the chain to jump and grab, and increase the chance of kickback.*

Hold the raker gauge on top of the cutters and file any exposed raker.

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Occasionally (once a week in constant use), take off the bar and clean the chain groove and bar holes. Turn the bar over when replacing it on the saw so that it wears evenly on both sides. File off any burrs along the bar edges to keep the chain running smoothly and riding into and out of a kerf without a hitch. Lubricate the bar's sprocket tip with grease.

Always be careful when handling a chain saw. Sharp cutters can inflict nasty cuts. Wear gloves or use a rag to protect your hands while working on the chain. Protect the chain with a cover.

Photographs: Fred Schneider

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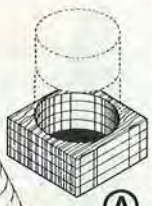

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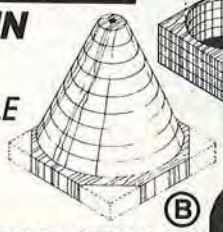

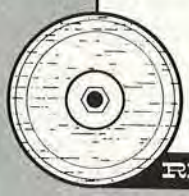

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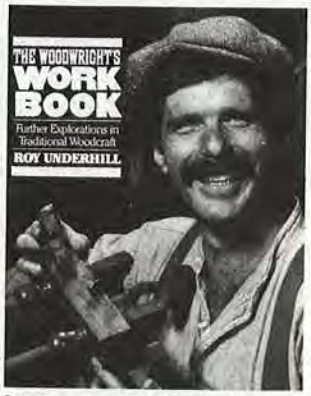

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In ancient Egypt, ebony was floated down the Nile from deep in the continent, and reserved strictly for pharoahs. King Tut's tomb yielded numerous objects made from the wood they called *hebni* — an ornate throne, several statues, numerous chests, and the sliding draw bolts that latched the doors for 2,500 years!

For India's reigning monarchs, nothing would do except ebony scepters to wave over their subjects. Because at that time it was believed the wood was an antidote for poison, royal households also had it made into drinking cups in hopes of foiling assassination attempts.

Even in the Old Testament, this sought-after wood made a newsworthy gift. In Ezekiel 27:15, it says "...they brought thee for a present horns of ivory and ebony."

History may repeat itself. Due to dwindling sources and foreign export regulations, ebony rises in price as supplies shrink. The blackest ebony, from Gaboon, Africa, is nearly impossible to find at any price. The black-brown-gray variegated ebony most often offered originates primarily in southern Asia. Even this macassar ebony sells for a royal ransom of $30 per board foot.

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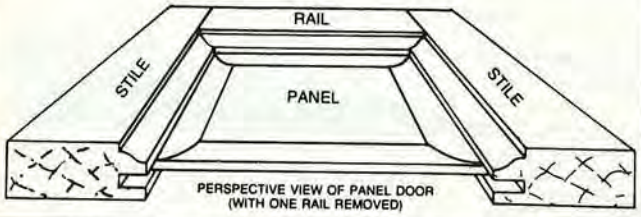

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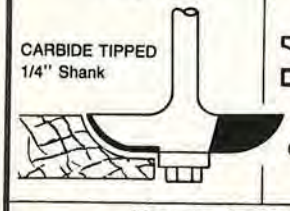

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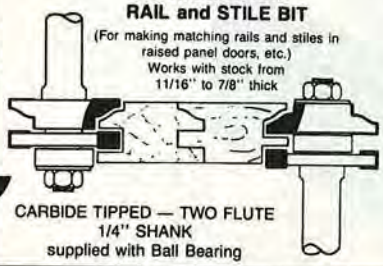

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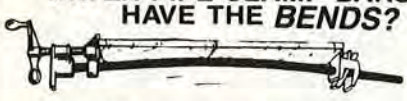

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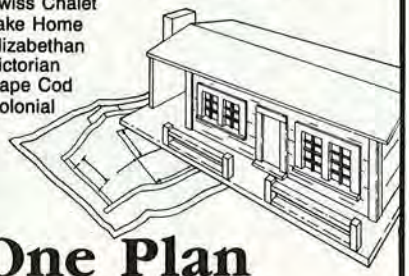

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The Bulletin Board

WOODWORKING FACTS, FACES, AND FABLES

OVERBEARING OAK

Of all North American forest trees commercially harvested, oak offers loggers the greatest number of choices — 74 species.

TREE COUNT: U.S.A.

According to the U.S. Department of Agriculture's handbook *Checklist of Native and Naturalized Trees of the U.S.,* 679 species of native trees grow in the continental United States. Florida claims the most with 314. Alaska has the fewest — 32. In addition, the USDA reports 69 foreign species introduced to the U.S. have adapted and now survive and reproduce naturally.

Print this article

TOOTHPICKS PRY AWAY AT IMPORTS

U.S. toothpick manufacturers have dropped from 20 to three since WWII. Flossing is partly to blame, but the decline primarily stems from less costly imports, says the *Wall Street Journal.*

Diamond Match Company's plant in West Peru, Maine, survives. The streamlined operation stamps out about 40 million flat birch toothpicks daily. A single tree yields 400,000. Another, the Forster Manufacturing Co., in Wilton, Maine, intends to clean up with a new design. It's square in the middle and round on the ends.

CHOPSTICKS PICK UP ON EXPORTING

In Minnesota's Iron Range community of Hibbing — an area hard hit by imported Japanese steel — displaced miners turn the tables. They export a resource as abundant as iron ore: aspen, in chopstick form.

Lakewood Industries' plant manager Scott Karppinen says they turn 65,000 cords of veneer quality aspen per day into 6 million pairs of 8″-long disposable chopsticks for direct shipment to Japan.

YEW GOTTA BE TOUGH

Researchers from Imperial College, England, believe that the yew used in some English medieval longbows demanded Rambo-type archers. Examination of old longbows retrieved from a warship sunk in 1545 shows that the wood was exceptionally close grained. Factoring the close grain with the length of the bow, they estimate longbowmen averaged 6′ tall and were strong enough to draw and hold a pull of 100 pounds! By comparison, today's recurved hunting bow requires a mere 60 pounds of pull. No wonder longbowmen could rout the enemy from 200 yards.

Missouri high schooler captures $500 prize in Dremel's annual contest for his oak and walnut doll chair.

YOUNG DESIGNERS CASH IN

Henry Burkemper, a high school sophomore from Elsberry, Missouri, turned his Cabbage Patch folding wood chair into a $500 cash prize in Dremel's Seventh Annual Creative Project Scholarship Contest. Made of oak and walnut, Henry's chair scooped junior division honors for design originality, workmanship, and completeness of project plans.

Junior Jon Henke, of Blue Earth, Minnesota, claimed top honors in the senior division with a polar bear he carved from soapstone.

High school students from across the nation entered more than 350 projects in the competition designed "to encourage students to combine imagination and craftsmanship," according to Robert E. Ludwig, of the Racine, Wisconsin, based company. Judges included Jim Downing, design editor of *WOOD*, and professional designers Carl Bullmore and Dale Staehle. "The number of quality projects was unbelievable" notes Downing. "But lots of kids lost out because they didn't include plans or submitted only incomplete ones."

In this contest, schools win, too. Dremel donates shop equipment to the schools of the 10 cash prize winners in each of two divisions: *junior*, for 9th and 10th grade students, and *senior*, for 11th and 12th grade students.

For entry forms, write: *Dremel Creative Contest, 4915 21st St., Racine, WI 53406.* The next entry deadline: February 22, 1988.

CLASS ACTION

with PowerStars II

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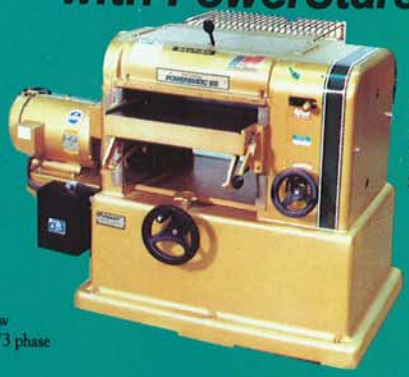

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Cat. No.	Description	Sug. Price	Sale Price
Combination/Planer			
35-606	9"x40 ATB&R	$82.05	**$46.75**
35-617	10"x50 ATB&R	$87.60	**$46.75**
35-657	12"x60 ATB&R*	$91.60	**$66.00**
Miter Box			
35-619	10"x60 TC&F	$105.40	**$49.50**
Sawbuck* Frame & Trim Saw			
35-593	8"x48 TC&F	$92.20	**$49.50**
Special Purpose			
35-611	10"x18 FT (Rip)	$74.60	**$43.50**
35-614	10"x48 ATB (Ply & Comp)	$98.15	**$46.75**
35-624	10"x80 TC&F (Laminates)	$137.60	**$82.50**

**1" arbor hole. Others 5/8" arbor hole.*

So hurry. The sale ends December 31, 1987. And if you miss the opportunity to get a Delta carbide-tipped saw blade at these prices — you may have to settle for something less.

For the name of your nearest Delta distributor call toll-free:
Delta International Machinery Corp., 800/438-2486 (in PA, 800/438-2487).
In Canada call 519/836-2840.

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